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Result
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Listing first 45 summaries
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1: /cgn2_6/ptodata/
2: /cgn2_6/ptodata/
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Copyright (c) 1993 - 2003
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/cgn2_6/ptodata/1/iaa/6B_COMB.pep:*
/cgn2_6/ptodata/1/iaa/B_COMB.pep:*
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US-09-449-335-2
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US-09-480-921B-10
US-09-481-362-2
US-09-491-362-2
US-09-368-590-2
US-09-368-590-2
US-09-568-102-5
US-09-568-102-5
US-09-568-480-5
US-09-568-480-5
US-09-568-472-5
US-09-568-472-5
US-09-568-472-7
US-08-804-227C-2
US-08-804-227C-2
US-08-804-227C-10
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Qy 2 Db 3 Qy 62 Db 61 Qy 119 Db 121	FILE REFE CURRENT A CURRENT F EARLIER A EARLIER F NUMBER OF SOFTWARE: SEQ ID NO LENGTH: TYPE: PR ORGANISM US-09-491-36 Dest Local Matches 1	RESULT 1 US-09-491-3 ; Sequence ; Patent No ; GENERAL I ; APPLICAN ; APPLICAN ; TITLE OF		
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PRIOR APPLICATION NUMBER: 09/491,362
PRIOR APPLICATION NUMBER: 09/491,362
PRIOR FILING DATE: 2000-01-26
PRIOR APPLICATION NUMBER: 60/118,349
PRIOR FILING DATE: 1999-02-03
NUMBER OF SEQ ID NOS: 13
SOFTWARE: Patentin Ver. 2.0
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; TYPE: PRT
; ORGANISM: Arabidopsis
US-09-874-562-7
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GENERAL INFORMATION:
APPLICANT: Busch Marco
APPLICANT: Hadri, Rudiger
APPLICANT: Martin, William
APPLICANT: Tietjen, Klaus
APPLICANT: Klott, Andreas
TITLE OF INVENTION: Method o
                                                                                                               GENERAL
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Patent No. 6303365
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Best Local Similarity
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TITLE OF INVENTION: 1 DEOXY-D-XYLULOSE-5-PHOSPHATE REDUCTOISOMERASE,
TITLE OF INVENTION: METHODS OF USE
FILE REFERENCE: WSUR17549
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CURRENT FILING DATE: 2001-06-04
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                                                                                     SEQ ID NO 2
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Best Local Similarity
Matches 162; Conserv
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ORGANISM: Arabidopsis thaliana
                                                                                                                                                                                                                                  APPLICANT: Tietjen, Klaus
APPLICANT: Kloti, Andreas
TITLE INVENTION: Method of determining the activity of
TITLE OF INVENTION: 1-deoxy-D-xylulose-5-phosphate reductoisomerase
TITLE OF INVENTION: 1-deoxy-D-xylulose-5-phosphate synthase
FILE REFERENCE: 2020US
                                                                                                                                                                                                                                                                                                                                                          APPLICANT: Busch, Marco
APPLICANT: Hain, Rudiger
APPLICANT: Martin, William
                                                                                                                          EARLIER APPLICATION NUMBER: DE 199 35 967.9
EARLIER FILING DATE: 1999-07-30
NUMBER OF SEQ ID NOS: 8
                                                                                                                                                                                          CURRENT APPLICATION NUMBER: US/09/449,335 CURRENT FILING DATE: 1999-11-24
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CURRENT APPLICATION NUMBER: US/09/449,335
CURRENT FILING DATE: 1999-11-24
EARLIER APPLICATION NUMBER: DE 199 35 967.9
EARLIER FILING DATE: 1999-07-30
                                                                                                         SOFTWARE: PatentIn
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                                              TYPE: PRT
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41.3%; Pred. No. 2e-67;
tive 71; Mismatches 140;
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US-09-480-921B-29
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Patent No.
Best Local Similarity
                Query Match
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Best Local
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APPLICANT: Wegrich, Lynette M.
TITLE OF INVENTION: Herbicide Target Genes
FILE REFERENCE: PB/5-30780A
CURRENT APPLICATION NUMBER: US/09/480,921B
CURRENT APPLICATION NUMBER: US/09/480,921B
CURRENT FILING DATE: 2000-01-11
NUMBER OF SEQ ID NOS: 29
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT: Levin, Joshua Z. APPLICANT: Budziszewski, Gregory
                                                                                                                                                                                                                                                                                                                                    TYPE: PRT
                                                                                           OTHER INFORMATION:
NAME/KEY: SITE
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OTHER INFORMATION:
NAME/KEY: SITE
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NAME/KEY: SITE
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NAME/KEY: SITE
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                                                                              LOCATION:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence 10, Application US/09480921B Patent No. 6387637
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APPLICANT: Budziszewski, G
APPLICANT: Potter, Sharon
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SOFTWARE: PatentIn Ver
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TITLE OF INVENTION: Herbicide Target Genes and
FILE REFERENCE: PB/5-30780A
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VHPQSIVHAMVGFCDGGLMAHLGPADMRHAIGFALNWPGR----GEVPVARIDLAQIASLT
                                                                                                                                        LALANKESLVTAGQLLMRTAQENGATILPVDSEHSAVFQALAGEDTACVERVIITASGGP
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                                  FRDWPVEKLKEVKVADALKHPNWNMGKKITVDSATLFNKGLEVIEAHYLFGAEYDDIEIV
                                                               FRDWSLERIRACTVAEAQAHPNWSMGQRISIDSASMFNKALELIETREFFGFEPDRIEAV
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Pred. No. 7.3e-67;
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                     GENERAL
                                 Sequence 2, Application Patent No. 6420159
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Best Local
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APPLICANT: Lange, Bernd M
TITLE OF INVENTION: 1-DECXY-D-XYLULOSE-5-PHOSPHATE REDUCTOISOMERASE,
TITLE OF INVENTION: METHODS OF USE
FILE REFERENCE: WSUR14977
CURRENT APPLICATION NUMBER: US/09/491,362
CURRENT FILING DATE: |2000-01-26
CURRENT FILING DATE: |2000-01-26
CARLIER APPLICATION NUMBER: 60//18,349
EARLIER FILING DATE: 1099-02-03
NUMBER OF SEQ ID NOS: | 13
APPLICANT: Croteau,
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                   INFORMATION:
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                                                                                                                                                                                                                                                                                                  VIHSPSIIHSMVETQDSSVLAQLGWPDMRLPILYTLSWPERVYCSEITWPRLDLCKV-DL
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                                                                                                                                                                                                                            PFKKPDNREIPAMDLAYAAWKSRSTMTGVLSAANEKAVEMFIDEKIGYLDIFKVVELTCD
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                                                      Application US/09874562
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Rodney
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39.2%; Pred. No. 1.6e-58;
tive 73; Mismatches 152
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                     ; SEQ ID NO 2
; LENGTH: 2293
; TYPE: PRT
                                                                                                     TITLE OF INVENTION: INTERACTING FULL FILE OF INVENTION: AUTOANTIGENS OF AUTOIMMUNE FILE REFERENCE: 101918-200 (OCR-941)
CURRENT APPLICATION NUMBER: US/09/368,590
CURRENT FILING DATE: 1999-08-04
EARLIER APPLICATION NUMBER: 60/095,657
FARTIER FILING DATE: 1998-08-07
                                                                                                                                                                                                                                                                                           GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                            Sequence 2, Application US/09368590 Patent No. 6187563
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CURRENT FILING DATE: 2001-06-04
PRIOR APPLICATION NUMBER: 09/491,362
PRIOR FILING DATE: 2000-01-26
PRIOR APPLICATION NUMBER: 60/118,349
DELICE ETITY CAMES: 1000-01-03
                                                                                  SOFTWARE: FastSEQ
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRIOR FILING DATE: 1999-02-03 NUMBER OF SEQ ID NOS: 13
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ORGANISM: Human
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Pred. No. 1.6e-58;
13; Mismatches 152;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CURRENT FILING DATE: 1998-06-26
NUMBER OF SEQ ID NOS: 43
SOFTWARE: FastSEQ for Windows Version 3.0
SEQ ID NO 2
LENGTH: 5215
TYPE: PRT
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                                                                                                                                                                                                                                                                                                                                                                                                   Query Match 5.8%; Score 115; DB 4; Length 5215; Best Local Similarity 20.2%; Pred. No. 0.11; Matches 108; Conservative 52; Mismatches 162; Indels 212; Gaps
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APPLICANT: Liu, H.
APPLICANT: Xue, Y.
APPLICANT: Zhao, L.
APPLICANT: DAO, L.
TITLE OF INVENTION: DNA encoding methymycin
FILE REFERENCE: 600.438US1
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                                                                                         1628 AAGEELDLTAYTQPALFAFEVALFRLLEHHGLVPDLLTGHSVGEIAAAHVAGVLSLDDAA 1687
                                                                                                                                                                                                                                                                                                 1509 QAVRLRTFEDGRPDVTVADLGRSLAARTAFEHKAALTTATRDELLAGLDAL-GRGEQATG 1567
1688 RLVTARGRLMQSAREGGA-MIAVQAGEAEVVESLKGYE----GRVAVAAVNGPTAVVVSG 1742
                                                                                                                                                                                                   1568 LYTGEPARAGRTAFLFTGQGAQRYAMGEELRAAHPYFAAALDTYYAALDRHLDRPLREIV 1627
                          126 SLVTAGQLLMRTAQENGATILPVDSEHSAVFQALAGEDTACVERVIITASGGPF----- 179
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ă i i i i i i i i i i i i i i i i i i i		706 LWRSWGVEPDAVVGHSM	4 TREFFGFEPDRIEAVVHPQSIVHAMVGFCDGGLMAHLGPADMRHAIGFALNWPGRGEVPV : : : : : : : : : :	164 TACVERVIITASGGPFRDWSLERIRACTVAEAQAHPNWSMGQRISIDSASMFNKALELIE 223	111 RALKHGRTLALANKESLVTAGQLLMRTAQENGATILPVDSEHSAVFQALAGED 163	59 AHEDC-LPALREALAGTGTEVAGGAQAIAEAADRPADWTMSAIVGAAGIVPGM 	4 LSIFGATGSIGESTFDLVMRKGGPEAFRTVALTGGRNIRRLAEMARALKAELAVT 58	y Match 5.7%; Score 113.5; DB 3; Length 7257; Local Similarity 24.0%; Pred. No. 0.26; hes 95; Conservative 42; Mismatches 136; Indels 123; Gaps 1	RRENT APPLICATION NUMBER: US/09/335, RRENT APPLICATION NUMBER: US/09/335, RRENT FILING DATE: 1999-06-17 MBER OF SEQ ID NOS: 30 FYMARE: PatentIn Ver. 2.0 ID NO 5 ENCTH: 7257 YPE: PRT YPE: PRT RGANISM: Sorangium cellulosum -335-409-5	ICANT: CY. DEVON ICANT: Goerlach, Joern ICANT: Goerlach, Joern ICANT: GOERS FOR THE BIOSYNTHESIS OF	INFORMATION: ANT: Schupp, Tho ANT: Ligon, Jame ANT: Molnar, Ist	11 335-409-5 ence 5, Application US/0933540 nt No. 6121029	323 967	907 FFPDGRRTDLPTYAFRREHYWLTPEARTDARALGFDPARHPLLTTTVEVAGGDGVLLTGR 196	REPALRLARDYMAARGLSGA	263 ADMRHAIGFALNWPGRGEVPVARIDLAQIASLTFQKPDEE	EEPRIPVVSTVTGALVTSGELTSPAYWVDQIRRPVRFLDAVRTLAAQDATVLVEIGP 184	EPDRIEAVVHPQSIVHAMV	180 -RDWSLERIKACTVAEAQAHPNWS-MGQRISIDSASMENKALELLETKEFFGF

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                                                                                                   GENERAL INFORMATION:
                                                                                                                 Sequence 5, Application Patent No. 6355457
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APPLICANT:
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                                 APPLICANT:
                                                             APPLICANT: Schupp, Thomas APPLICANT: Ligon, James
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APPLICANT: Goerlach, Joern
TITLE OF INVENTION: GENES FOR THE BIOSYNTHESIS
FILE REFERENCE: 4-30582A
CURRENT APPLICATION NUMBER: US/09/568,102
CURRENT FILING DATE: | 2000-05-10
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PRIOR FILING DATE: 1999-06-17
NUMBER OF SEQ ID NOS: 30
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Pred. No. 0.26;
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                                                                          SEQ ID NO 5
                                                                                                                                                                                                                                                                                                                                                                          GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                          Sequence 5, Applic Patent No. 6355458
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                                                                                            SOFTWARE: PatentIn
                                                                                                              NUMBER OF SEQ ID NOS:
                                                                                                                                  PRIOR APPLICATION NUMBER: 09/335,409 PRIOR FILING DATE: 1999-06-17
                                                                                                                                                                       CURRENT APPLICATION NUMBER: US/09/568,480
CURRENT FILING DATE: 2000-05-10
                                                                                                                                                                                                             APPLICANT: Cyr, Devon
APPLICANT: Goetlach, Joern
TITLE OF INVENTION: GENES FOR THE BIOSYNTHESIS
FILE REFERENCE: 4-30582A
                                                                                                                                                                                                                                                                                                             APPLICANT:
                                                                                                                                                                                                                                                                                                                                APPLICANT: Schupp, Thomas APPLICANT: Ligon, James
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CURRENT FILING DATE: 2000-05-10
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TYPE: PRT
ORGANISM: Sorangium cellulosum
          TYPE: PRT ORGANISM: Sorangium cellulosum
                                                        LENGTH:
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Zirkle, Ross
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24.08;
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Query Match

5.78;

Score 113.5;

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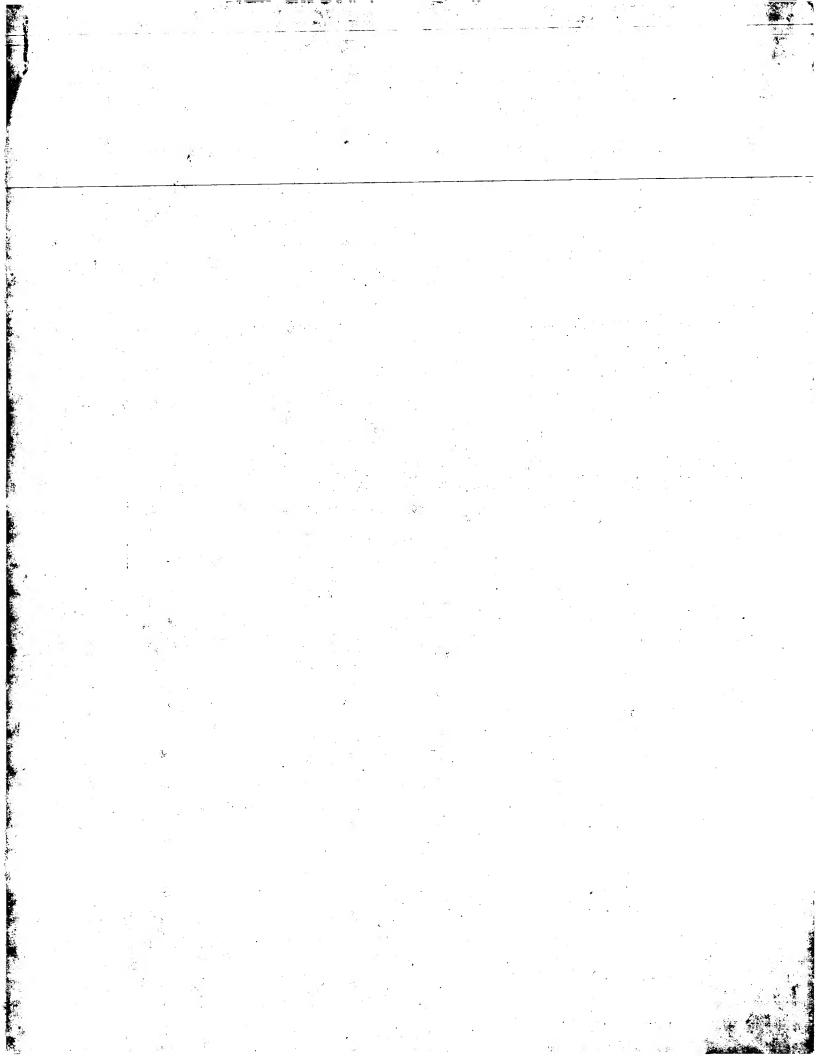
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; TYPE: PRT
; ORGANISM: Sorangium cellulosum
US-09-568-486-5
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SEQ ID NO 5
LENGTH: 7257
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                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRIOR APPLICATION NUMBER: 09/335,409
PRIOR FILING DATE: 1999-06-17
NUMBER OF SEQ ID NOS: 30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT: GOERIACH, JOERN
TITLE OF INVENTION: GENES FOR THE BIOSYNTHESIS OF EPOTHILONES
FILE REFERENCE: 4-30582A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CURRENT APPLICATION NUMBER: US/09/568,486
CURRENT FILING DATE: 2000-05-10
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  5616 AARGHAST-GSAPKVVFVFPGQ--
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                                  111 RALKHGRTLALANKESLYTAGQLLMRTAQENGATILPVDSEHSAVFQALAGED----- 163
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: Ligon, James
: Molnar, Istvan
: Zirkle, Ross
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24.0%; Pred. No. 0.26;
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-GSQWLGMGQKLLSEEPVFRDAL 5658
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                                               344 DMAAVVEETLAGVSTDP----LFGKVPDALEEVLAM 375
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DRLSV-----AVSNSPRSTVLAGE-PAALAEVLAI 5806
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                                                                                                   -EDAVAI-ICRRSLLIRRISGQGEMAVVELSLAEAEAALLGYE 5777
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Search completed: April 15, 2003, 14:00:29 Job time : 37 secs



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Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
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Perfect score:
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AAY52839
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1418.939 Million cell updates/sec
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                                                                                            Rhodobacter sphaer
Isoprenoid related
Isoprenoid related
Isoprenoid related
Isoprenoid related
                                                                                                                                                                                                                   Description
                                     Methylomonas 16a s
Methylomonas 16a o
Isoprenoid related
-deoxy-D-xylulose
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            .DAT:*
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	AAG81207	22	436	_	628
Isoprenoid related	AAO21894	23	433	_	628
Propionibacterium	AAU56274	22	411	2	644
1-deoxy-D-xylulose	AAB01371	21	475	ω.	654.5
Mentha piperita 1-	AAY97196	21	475	ω	654.5
	AA021891	23	386	ω.	665.5
Isoprenoid related	AA021892	23	388	Ψ	670
	AA021876	23	388	ω.	670
	AA021890	23	402		685
Isoprenoid related	AA021880	23	402	٠	685
×	AAB01363	21	499	4.	689.5
Isoprenoid related	AA021888	23	394	5	695.5
Isoprenoid related	AA021881	23	394	5	695.5
Listeria monocytog	ABB48625	23	380	5	702.5
Isoprenoid related	AA021889	23	400	6.	716
herichi	AAY52838	20	398	6	716
H. influenzae DXR	ABB09436	23	397	٥.	717
	AA021887	23	397	36.1	717
Isoprenoid related	AA021877	23	397	6	717
Arabidopsis herbic	AAY95659	21	477	6.	720.5
×	AAB01368	21	475	6.	725.5
	AA021885	23	398	6	732
Isoprenoid related	AA021878	23	398	36.9	732
Arabidopsis herbic	AAY95658	21	477	7.	736
1-deoxy-D-xylulose	AAB31985	22	477	7.	737.5
Herbicidally activ	ABB93922	23	477	37.4	41
Isoprenoid related	AA021895	23	477	.7	41
1-deoxy-D-xylulose	AAB31986	22	477	7.	741.5
ab	AAB30296	21	476	7.	741.5
A. thaliana DXPRI	AAB11413	21	420	7.	741.5
1-deoxy-D-xylulose	AAB01370	21	406	37.4	741.5
thaliana	1141	21	406	7.	741.5
A. thaliana partia	719	21	399	37.4	741.5
×	AAB01362	21	473	37.4	742
Isoprenoid related	AA021886	23	394	37.5	743.5

ALIGNMENTS

394 AA.

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PN	XX	SO	×	Χ¥	XX	ΧW	XW	KW	XX	DE	XX	ΡŢ	×	AC	XX	ID	AAY52839	RESULT	
WO9953071-A1.		Rhodobacter sphaeroides.		2-C-methyl-D-erythreitol-4-	1-deoxy-D-xylulose-5-phosphi	health food; antifouling coa	heart disease; osteoporosis	Isoprenoid; microorganism; o		Rhodobacter sphaeroides prof		26-JAN-2000 (first entry)		AAY52839;		AAY52839 standard; Protein;	2839	LT 1	

protein sequence SEQ ID NO:30

Isoprenoid; microorganism; detection; antibacterial; herbicide; heart disease; osteoporosis; haemostasis; cancer; immunopotentiation; health food; antifouling coating; farnesyl pyrolinic acid; pyruvic acid; 1-deoxy-D-xylulose-5-phosphate; glycerylaldehyde-3-phosphate; 2-C-methyl-D-erythreitol-4-phosphate.

X	ΡI	ΡI	×	PΑ	XX	PR	PR	PR	X	ΡF	×	PD	XX
	Takahashi S;	Miyake K, Has		(KYOW) KYOWA HAKKO KOGYO KK.		15-FEB-1999;	05-AUG-1998;	14-APR-1998;		14-APR-1999;		21-OCT-1999.	
		Hashimoto S, Motoyama H,		HAKKO KOGYO		99JP-0035739	98JP-0221910.	98JP-0103101		99WO-JP01987.			
		Motoyama	•	KK.		739.	910.	101.		987.			•
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		Ozaki A,											
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              compound comprising using at least 1 DNA e.g. encoding proteins which celevate the efficiency of the synthesis or DNA encoding a farnesyl compound comprises using at least 1 DNA, a vector, cloned cells, their compound comprises using at least 1 DNA, a vector, cloned cells, their certaing the isoprenoid accumulated in the medium. The DNA encodes at least 1 of the following: (a) a compound for activating or catalysing cells the production of 1-deoxy-D-xylulose-5-phosphate from pyruvic acid and cells; the production of 1-deoxy-D-xylulose-5-phosphate from pyruvic acid and cells; (c) a protein which elevates the efficiency of synthesis of 1 soprenoid compounds and comprises a 3 or 4 amino acid sequence cells of the anino acids being deleted or substituted or an additional amino acids being deleted or substituted or an additional amino acids being deleted or which activates or catalyses the production of 2-C-methyl-D-erythreitol-cells or catalyses the production of 3 compounds are useful in drugs (e.g. for the treatment of heart diseases, osteoporosis and hemostatis, con the non-mevalonate pathway and can be used as antibacterials and centricides. The present sequence is used in the exemplification of the present invention.
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Matches 394
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Preparation of recombinant isoprenoid compounds useful for treatment of heart diseases, osteoporosis and hemostatis, preventing cancer and immunopotentiation
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      present invention describes the preparation of an isoprenoid pound comprising using at least 1 DNA e.g. encoding proteins which
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LFGKVPDALEEVLAMDHLARRAAEEAAGLRQQKR 394
                                                                                                                                              LFGKVPDALEEVLAMDHLARRAAEEAAGLRQQKR 394
                                                                                                                                                                                                EERFPALRLARDVMAARGLSGAAFNAAKEIALDHFIAGRIGFLDMAAVVEETLAGVSTDP
                                                                                                                                                                                                                                                                                                                            DWSLERIRACTVAEAQAHPNWSMGQRISIDSASMFNKALELIETREFFGFEPDRIEAVVH
                                                                                                                                                                                                                                                                                                                                               DWSLERIRACTVAEAQAHPNWSMGQRISIDSASMFWKALELIETREFFGFEPDRIEAVVH
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EDCLFALREALAGTGTEVAGGAQAIAEAADRPADWTMSAIVGAAGLVPGMRALKHGRTLA 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1999-620434/
DB; AAZ33164.
                                                                                                                                                                               EERFPALRLARDVMAARGLSGAAFNAAKEIALDHFIAGRIGFLDMAAVVEETLAGVSTDP
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Matches 194
                                                                                                                                                                                                                                                                                                                                                                                 isoprenoids. More particularly the invention provides isolated nucleic acids, substantially pure polypeptides, host cells, and methods for producing various isoprenoid compounds. The polypeptides are useful for the production of isoprenoids, especially CoQ(10). Expressing the pure polypeptides, which has 1-deoxyxylulose-5-phosphate synthase (DXS) activity or decaprenyl diphosphate synthase (DDS) activity, is useful fincreasing production of CoQ(10) in a cell having endogenous DDS activity. This sequence represents a protein relating to the isoprenoid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Substantially pure polypeptides having e.g., 1-deoxyxylulose-5-phosphate synthase activity, production of isoprenoids, especially CoQ(10)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sphingomonas trueperi.
                                                                                                                                                                                                                                                                                                                                                 Sequence
                                                                                                                                                                                                                                                                                                                                                                         production
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    The invention relates to methods and materials for the production of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Disclosure;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gokarn R,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          29-SEP-2000; 2000US-236580P
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                                                                                                                                                            LANKESLYTAGQLLMRTAQENGATILPYDSEHSAYFQALAGEDTACVERYIITASGGPFR
                                                                                                                                                                                               MRSLSIFGATGSIGESTFDLVMRKGGPEAFRTVALTGGRNIRRLAEMARALKAELAVTAH
                                               RQSVVHSMVEYVDGSVLAQLGTPDMRTPIAYALAWPERMETLCPPLDLATVGKLEFENPD
                                                            PQSIVHAMVGFCDGGLMAHLGPADMRHAIGFALNWPGRGEVPVARIDLAQIASLTEQKPD
                                                                                                           DWSLERIRACTVAEAQAHPNWSMGQRISIDSASMFNKALELIETREFFGFEPDRIEAVVH
            EERFPALRLARDVMAARGLSGAAFNAAKEIALDHFIAGRIGFLDMAAVVEETLAGVSTDP
                                                                                                ATPKEAMRDITPAQAVAHPNWSMGAKISVDSATMMNKGLELIEAFHLFPVAAEQLAVLVH
                                                                                                                                                LANKESLYSAGEVMMAAARAHGATLLPVDSEHNAVFQCLDRTAPRGVRRIILTASGGPFR
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                                                                                                                                                                                                                                                                                                             Similarity
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                                                                                                                                                                                                                                                                                                                                                 386
                                                                                                                                                                                                                                                                                                                                                                         of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Jessen H,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Fig 30; 246pp; English
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                                                                                                                                                                                                                                                                                                   Conservative
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                                                                                                                                                                                                                                                                                                                                                                         invention.
                                                                                                                                                                                                                                                                                                             46.3%;
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                                                                                                                                                                                                                                                                                                   62;
                                                                                                                                                                                                                                                                                                            Score 918.5; DE Pred. No. 8e-85;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     polypeptides, which has 1 deoxyxylulose-5-phosphate synthase (DXS) activity or decaprenyl diphosphate synthase (DDS) activity, is use increasing production of COQ(10) in a cell having endogenous DDS activity. This sequence represents a protein relating to the isopr production of the invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Substantially pure polypeptides having e.g., 1-deoxyxylulose-5-phosphate synthase activity, production of isoprenoids, especially CoQ(10)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gokarn R,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         04-APR-2002
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AA021879
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Disclosure; Fig 27;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         29-SEP-2000; 2000US-236580P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 28-SEP-2001; 2001WO-US30328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Zymonas mobilis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Isoprenoid; CoQ(10); 1-deoxyxylulose-5-phosphate synthase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Isoprenoid related protein sequence SEQ ID No 101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         13-SEP-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (CRGI ) CARGILL INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 358
     242
                                                             183
                                                                                                                                                                  123 ANKESLVSAGGLMIDAVREHGTTLLPVDSEHNAIFQCFPHHNRDYVRRIIITASGGPFRT 182
                                                                                                                                                                                                                                                                                     63 SLYNDLKEALAGSSVEAAAGADALVEAAMMGADWTMAAIIGCAGLKATLAAIRKGKTVAL
                                                                                                                                                                                                                                                                                                                                       62 DCLPALREALAGTGTEVAGGAQAIAEAADRPADWTMSAIVGAAGLVPGMRALKHGRTLAL
                                                                                                                                                                                                                                                                                                                                                                                                     5
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                                                                                                                                                                                                                                                                                                                                                                                                                                                 RSLSIFGATGSIGESTFDLVMRKGGPEAFRTVALTGGRNIRRLAEMARALKAELAVTAHE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QSIVHAMVGFCDGGLMAHLGPADMRHAIGFALNWPGRGEVPVARIDLAQIASLTFQKPDE
                                                        TSLAEMATVTPERAVQHPNWSMGAKISIDSATMMNKGLELIEAYHLFQIPLEKFEILVHP
                                                                                           WSLERIRACTVAEAQAHPNWSMGQRISIDSASMFNKALELIETREFFGFEPDRIEAVVHP
                                                                                                                                                                                                                                                                                                                                                                                               RTVTVLGATGSIGHSTLDLIER--NLDRYQVIALTANRNVKDLADAAKRINAKRAVIADP
                                                                                                                                                                                                                          ANKESLVTAGQLLMRTAQENGATILPVDSEHSAVFQALAGEDTACVERVIITASGGPFRD 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  al Similarity
183; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   standard; . Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Jessen H,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               388 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               246pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          44.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Zidwick
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  67;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 876; DB 23;
Pred. No. 1.7e-80;
7; Mismatches 130;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               K
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 379
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ₿
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           useful
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 388;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               the isoprenoid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DXS; DDS;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       useful for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                             241
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  301
                                                        242
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40 Ad 64

122

63

ANKESLVTAGQLLMRTAQENGATILPVDSEHSAVFQALAGEDTACVERVIITASGGPFRD

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RESULT 4
AAO21883
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                                                    Query Match
Best Local S
Matches 183
                                                                                                                                                                                   The invention relates to methods and materials for the production of isoprenoids. More particularly the invention provides isolated nucleic acids, substantially pure polypeptides, host cells, and methods for producing various isoprenoid compounds. The polypeptides are useful for the production of isoprenoids, especially CoQ(10). Expressing the pure polypeptides, which has 1-deoxyxylulose-5-phosphate synthase (DXS)
                                                                                                                                             activity or decaprenyl diphosphate synthase (DDS) activity, is useful for increasing production of CoQ(10) in a cell having endogenous DDS activity. This sequence represents a protein relating to the isoprenoid
                                                                                                                                                                                                                                                                                                         Substantially pure polypeptides having e.g., 1-deoxyxylulose-5-phosphate synthase activity, production of isoprenoids, especially CoQ(10)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               04-APR-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Isoprenoid; CoQ(10); 1-deoxyxylulose-5-phosphate synthase;
decaprenyl diphosphate synthase.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               13-SEP-2002
                                                                                                      Sequence
                                                                                                                                                                                                                                                                                  Disclosure; Fig 32; 246pp; English.
                                                                                                                                                                                                                                                                                                                                                               WPI; 2002-416480/44.
                                                                                                                                                                                                                                                                                                                                                                                       Gokarn R,
                                                                                                                                                                                                                                                                                                                                                                                                                                            29-SEP-2000; 2000US-236580P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    28-SEP-2001;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Zymonas mobilis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AA021883;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AAO21883 standard; Protein;
                                                                                                                                  production
                                                                                                                                                                                                                                                                                                                                                                                                                 (CRGI ) CARGILL INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Isoprenoid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             362
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  σ
             TPATPSSLEDVFAIDNEAR---IQAAALME
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FGKVPDALEEVLAMDHLARRAAEEAAGLRQ 391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ERFPALTLAMESIKSGGARPAVMNAANEIAVAAFLDKKIGFLDIAKIVEKTL-----DHY 357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ERFPALRLARDYMAARGLSGAAFNAAKEIALDHFIAGRIGFLDMAAVYEETLAGVSTDPL
 RTVTVLGATGSIGHSTLDLIER--NLDRYQVIALTANRNVKDLADAAKRTNAKRAVIADP
                                                      183;
                                                               Similarity
                                                                                                                                    of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 related protein sequence
                                                                                                         388
                                                                                                                                                                                                                                                                                                                                                                                       Jessen H,
                                                    44.2%;
ilarity 46.9%;
Conservative 6
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                                                                                                         ₽,
                                                                                                                                    invention
                                                                                                                                                                                                                                                                                                                                                                                        Zidwick
                                                      67;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  388
                                                    Score 876; DB 23;
Pred. No. 1.7e-80;
7; Mismatches 130;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQ ID No 116
                                                                                                                                                                                                                                                                                                                       useful for
                                                                               Length 388;
                                                    Indels
                                                    10;
                                                   Gaps
 62
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                           e.g. ammonia, nitrate, nitrite or nitrogen. It is also useful for the production of a feed product comprising a protein, carbohydrates and a pigment and for reducing oxygen demand, for removing nitrates and nitrites in methane-containing environments such as landfills, waste water treatment systems or anywhere that methane, oxygen and nitrates a
                                                                                                                      The invention relates to a high growth methanotrophic bacterial strain, which grows on a Cl carbon substrate e.g. methane and methanol, and comprises a functional Embden-Meyerhof carbon flux pathway comprising a gene coding a pyrophosphate dependent phosphofrutokinase enzyme or a 16 RNA. The bacterial strain is useful for the production of single cell
                                                                                                                                                                                                                                             New high growth methanotrophic bacterial strain, useful for producing single cell proteins; grows on a Cl carbon substrate, and comprises a functional gene encoding in Embden-Meyerhof carbon pathway
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     pyrophosphate dependent phosphofrutokinase; nitrogen-containing ammonia; nitrate; nitrite; nitrogen; pigment; oxygen; landfill; methane-containing environment; waste water treatment system; is
 present. The denitrifying
                                                                                       protein and for the biotransformation of a nitrogen-containing compound, e.g. ammonia, nitrate, nitrite or nitrogen. It is also useful for the
                                                                                                                                                                                                                     Claim 11;
                                                                                                                                                                                                                                                                                                                               WPI;
                                                                                                                                                                                                                                                                                                                                                          Koffas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                14-MAR-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Methylomonas 16a
                                                                                                                                                                                                                                                                                                                                                                                     (DUPO)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                  28-AUG-2001;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ABG61582 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       358
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                                                                                                                                                                                                                                                                                                                            2002-452200/48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   growth methanotrophic bacterial strain;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TPATPSSLEDVFAIDNEAR---IQAAALME 384
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QSVIHSMVEYLDGSILAQIGSPDMRTPIGHTLAWPKRMETPAESLDFTKLRQMDFEAPDY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FGKVPDALEEVLAMDHLARRAAEEAAGLRQ
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QSIVHAMVGFCDGGLMAHLGPADMRHAIGFALNWPGRGEVPVARIDLAQIASLTFQKPDE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    WSLERIRACTVAEAQAHPNWSMGQRISIDSASMFNKALELIETREFFGFEPDRIEAVVHP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ERFPALTLAMESIKSGGARPAVMNAANEIAVAAFLDKKIGFLDIAKIVEKTL----DHY
                                                                                                                                                                                                                                                                                                                                                          Z,
                                                                                                                                                                                                                                                                                                                                                                                       DO
                                                                                                                                                                                                                                                                                                               ABK83261.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           oxide; terpenoid; animal feed;
 The bacterial strain of the invention can be ying agent for the conversion of nitrate or ni
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      methanol;
                                                                                                                                                                                                                  Page 141-142; 157pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 methanotrophic
                                                                                                                                                                                                                                                                                                                                                                                                                                                  2001WO
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                                                                                                                                                                                                                                                                                                                                                        χ̈
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Embden-Meyerhof carbon flux pathway; 16s RNA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Protein;
                                                                                                                                                                                                                                                                                                                                                                                     NEMOURS &
                                                                                                                                                                                                                                                                                                                                                                                                                                                   US26827
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                bacterial strain polypeptide #32
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           394
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                                                                                                                                                                                                                  English
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           carotenoid;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Cl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   carbon substrate;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           exopolysaccharide.
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 nitrous
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WO200218617-A2 Methylomonas 16a

Brzostowicz

PC,

, MC

Picataggio

Cheng Q, aggio SK,

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Dicosimo

, PE;

Koffas

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Miller

ES

Rouviere

(DUPO)

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PONT DE NEMOURS

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01-SEP-2000; 01-SEP-2000;

2000US-229858P 2000US-229907P

04-SEP-2001; 07-MAR-2002

2001WO-US27420

XX

25-JUL-2002

(first

entry)

aquaculture;

enzyme;

Carotenoid; Methylomonas

16a

sp.

isopentenyl pyrophosphate; antheraxanthin; astaxanthin; t; steroid; flavour; fragrance; electro-optic application

diet;

D-1-deoxyxylulose-5-phosphate reductoisomerase

D-1-deoxyxylulose-5-phosphate

anti-oxidant;

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RESULT 6
AAE22302
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            oxide with methane or methanol as a carbon source. It is also used in production of biomass including proteins, carbohydrates and a wide variety of pigments (particularly for isoprenoid pigments for the purpose of generating animal feeds), in production of terpenoid and carotenoid compounds, useful as pigments and as monomers in polymeric materials and in production of exopolysaccharides at high levels. Sequences ABG61551-ABG61590 represent high growth methanotrophic bacterial strain proteins of the invention.
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                AAE22302
                                             AAE22302 standard;
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                                                                                                                                                        TLAGVSTDPLFGKVPDALEEVLAMDHLARRAAEE
                                                                                                                                                                                        GHMDFEKPDLKRFPCLRLAYEAIKSGGIMPTVLNAANEIAVEAFLNEEVKFTDIAVIIER
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                                                                                                                         SMAQFKPDD----AGSLELVLQADQDAREVARD
                                                                                                                                                                                                                    ASLITFQKPDEERFPALRLARDVMAARGLSGAAFNAAKEIALDHFIAGRIGFLDMAAVVEE
                                                                                                                                                                                                                                                                                                                                             ITASGGPFRDWSLERIRACTVAEAQAHPNWSMGQRISIDSASMFNKALELIETREFFGFE
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Similarity 41.6%;
64; Conservative
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                                             Protein;
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Pred. No. 1.7e-70;
5; Mismatches 139
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            The invention relates to a method for producing carotenoid compounds. The method comprises a transformed metabolising host cell, comprising suitable levels of isopentenyl pyrophosphate and a nucleic acid molecule encoding an enzyme in the carotenoid biosynthetic pathway, under the control of regulatory sequences, and contacting the host cell with carbon control of regulatory sequences, and contacting the host cell with carbon control of regulatory sequences, and contacting the host cell with carbon control of regulatory sequences.
                       Methylomonas 16a ORF2 dxr protein sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     substrate to produce a carotenoid compound. The method is useful for producing carotenoid compounds such as antheraxanthin and astaxanthin, by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Producing carotenoid compounds e.g. antheraxanthin and astaxanthin, by using microorganisms having a nucleic acid molecule encoding enzymes in the carotenoid biosynthetic pathway and which metabolize single carbon
                                                                           AAU80326
                                                                                                    AAU80326 standard;
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 Isoprenoid
                                                   15-JUL-2002
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                                                                                                                                                                   SMAQFKPDD-----AGSLELVLQADQDAREVARD 387
                                                                                                                                                                                         TLAGVSTDPLFGKVPDALEEVLAMDHLARRAAEE
                                                                                                                                                                                                                                  ITASGGPFRDWSLERIRACTVAEAQAHPNWSMGQRISIDSASMFNKALELIETREFFGFE
                                                                                                                                                                                                                                                                                                                                                                       GHMDFEKPDLKRFPCLRLAYEAIKSGGIMPTVLNAANEIAVEAFLNEEVKFTDIAVIIER
                                                                                                                                                                                                                                                                     PDQIEVVIHPQSIIHSMVDYVDGSVLAQMGNPDMRTPIAHAMAWPERFDSGVAPLDIFEV
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity
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 biosynthetic
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                                                  (first entry)
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 enzyme;
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isoprenoid compound;
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The present invention relates to a new nucleic acid molecule encoding an isoprenoid biosynthetic enzyme isolated from Methylomonas 16a. The invention is useful for obtaining a nucleic acid molecule encoding an isoprenoid compound biosynthetic enzyme, and for the microbial production of isoprenoid compounds. The molecules of the invention are also useful for regulating isoprenoid biosynthesis in an organism and for producing recombinant organisms for producing various isoprenoid compounds. The nucleic acid is also useful for feed additive, for the production of keratenoids and their derivatives, isoprenoid: intermediates, and as pure products useful as pigments, flavours and fragrances. The present amino acid sequence represents the Methylomonas 16a open reading frame 2 (ORF2) dxr (1-deoxyxylulose-5-phosphate reductoisomerase enzyme) protein of the invention, as described above.
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                                                                                                  Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Claim 4; Page 68-70; 84pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Novel nucleic acid molecule encoding a isoprenoid biosynthetic enzyme, isolated from Methylomonas 16a, useful for the production of isoprenoid
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Cheng Q,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               keratenoid; pigment; flavour; fragrance; open reading frame dxr; 1-deoxyxylulose-5-phosphate reductoisomerase enzyme.
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DB; ABK50082.
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                                                                                                      394 AA;
39.2%;
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Score 778; DB 23; Pred. No. 1.7e-70;
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                              Length 394;
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Query Match
Best Local Similarity
Matches 164; Conserv
 117
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                                                                                                                                                 MRSLSIFGATGSIGESTFDLVMRKGGPEAFRTVALTGGRNIRRLAEMARALKAELAVTAH
                                                                         EDCLPALREALAGT - - - GTEVAGGAQAIAEAAD - RPADWTMSAIVGAAGLVPGMRALKHG
                                                                                                                 MKGICILGATGSIGVSTLDVVARH--PDKYQVVALTANGNIDALYEQCLAHHPEYAVVVM
RTLALANKESLVTAGQLLMRTAQENGATILPVDSEHSAVFQAL----AGEDTACVERVI
                                     ESKVAEFKQRIAASPVADIKVLSGSEALQQVATLENVDTVMAAIVGAAGLLPTLAAAKAG
                                                                                                                                                                                           Conservative
                                                                                                                                                                                         75;
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171
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KTVLLANKEALVMSGQIFMQAVSDSGAVLLPIDSEHNAIFQCMPAGYTPGHTAKQARRIL

178

PDRIEAVVHPQSIVHAMVGFCDGGLMAHLGPADMRHAIGFALNWPGRGEVPVARIDLAQI

291

231 238

PDQIEVVIHPQSIIHSMVDYVDGSVLAQMGNPDMRTPIAHAMAWPERFDSGVAPLDIFEV

TLAGVSTDPLFGKVPDALEEVLAMDHLARRAAEE

GHMDFEKPDLKRFPCLRLAYEAIKSGGIMPTVLNAANEIAVEAFLNEEVKFTDIAVIIER

ASLTFQKPDEERFPALRLARDVMAARGLSGAAFNAAKEIALDHFIAGRIGFLDMAAVVEE

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                                                                                                                                                                                                                                                                             The invention relates to methods and materials for the production of isoprenoids. More particularly the invention provides isolated nucleic acids, substantially pure polypeptides, host cells, and methods for producing various isoprenoid compounds. The polypeptides are useful for the production of isoprenoids, especially COQ(10). Expressing the pure polypeptides, which has 1-deoxyxylulose-5-phosphate synthase (DXS) activity or decaprenyl diphosphate synthase (DDS) activity, is useful for increasing production of COQ(10) in a cell having endogenous DDS activity. This sequence represents a protein relating to the isoprenoid
                                                                                                                                                                                                                                                                                                                                                                                                             Substantially pure polypeptides having e.g., 1-deoxyxylulose-5-phosphate synthase activity, production of isoprenoids, especially CoQ(10).
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                                                                                                                                                                                                                                                  Sequence
                                                                                                                                                                                                                                                                                                                                                                                          Disclosure; Fig 32;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AAO21884 standard;
                                                                                                                                                                                                                                                                       production
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (CRGI ) CARGILL INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     29-SEP-2000; 2000US-236580P
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            decaprenyl diphosphate synthase
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            236
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                                                                                                                                                                                  4 LSIFGATGSIGESTFDLVMRKGGPEAFRTVALTGGRNIRRLAEMARALKAELAVTAHEDC
EAVVHPQSIVHAMVGFCDGGLMAHLGPADMRHAIGFALNWPGRGEVPVARIDLAQIASLT
                                                                                     LANKESLVTAGQLLMRTAQENGATILPVDSEHSAVFQALA-----GEDTACVERVIITAS
                                                                                                                                          LPALREALAGTG - - TEVAGGAQAIAEAADRP - ADWTMSAIVGAAGLVPGMRALKHGRTLA
                                                                                                                                                               ISVLGATGSIGLSTLDVVQRH---PDRYEAFALTGFSRLAELEALCLRHRPVYAVVPEQAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                         2002-416480/44
                                GGPFRETPLEQLASVTPEQACAHPNWSMGRKISVDSASMMNKGLELIEACWLFDAQPSQV
                                                     GGPFRDWSLERIRACTVAEAQAHPNWSMGQRISIDSASMFNKALELIETREFFGFEPDRI
                                                                           LANKEALVMSGALFMQAVKRSGAVLLPIDSEHNAIFQSLPRNYADGLERVGVRRILLTAS
                                                                                                                     ATALOGSLAAAGIRTRVLFGEQALCEVASAPEVDMVMAAIVGAAGLPSTLAAVEAGKRVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SMAQFKPDD-
                                                                                                                                                                                                          166;
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                                                                                                                                                                                                       Similarity 42.8
66; Conservative
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                                                                                                                                                                                                      Score 775.5; DB 23;
pred. No. 3.2e-70;
73; Mismatches 134;
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Best Local S
Matches 166
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166;
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           SLLNELKEALAGCEEMPEIIPGEQGVIEVARHPDAVTVVTGIVGCAGLKPTVAAIEAGKD
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                                                                          RSLSIFGATGSIGESTFDLVMRKGGPEAFRTVALTGGRNIRRLAEMARALKAELAVTAHE
                                DCLPALREALAGTG --TEVAGGAQAIAEAADRP-ADWTMSAIVGAAGLVPGMRALKHGRT
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                                                                                                         Similarity
                                                                                                                                          473
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Вb
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                                                                                                                                                                                                                                                                                                Nucleic acids encoding 1-deoxy-D-xylulose-5-phosphate reductoisomerase are useful for creating transgenic plants with altered levels of plastid isopentenyl diphosphate in cells.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                      expression of the enzyme
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DB; AAA47412.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    isopentenyl diphosphate; mapping; breeding; phenotype;
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Score 756.5;
Pred. No. 3.6e
59; Mismatches
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3.6e-68;
ches 138;
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RESULT 10
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Query Match
Best Local Similarity
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                                                                       Sequence
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Pred.
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746;
No.
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DB 21;
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                       Length 472
                                                                                                                                                                                                                                                                                                                                                                                                                                                                isopentenyl
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RESULT 11
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                                                                                                     Substantially pure polypeptides having e.g., 1-deoxyxylulose-5-phosphate synthase activity,
                                                                                                                                  WPI;
                                                                                                                                                                                                                                                                                             Isoprenoid; decaprenyl
                                                                                                                                                                                                                                                                                                                                                                                   AAO21886 standard; Protein;
                                                                          Disclosure;
                                                                                             production
                                                                                                                                                      Gokarn R,
                                                                                                                                                                                             29-SEP-2000;
                                                                                                                                                                                                                28-SEP-2001;
                                                                                                                                                                                                                                    04-APR-2002
                                                                                                                                                                                                                                                       WO200226933-A2
                                                                                                                                                                                                                                                                         Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                          Isoprenoid
                                                                                                                                                                                                                                                                                                                                             13-SEP-2002
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SLVDELKEALADCEEKPEIIPGEQGVIEVARHPDAVTVVTGIVGCAGLKPTVAAIEAGKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                     ----VSTDPLFGKVPDALEEVLAMDHLARRAA---EEAAGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FQKPDEERFPALRLARDVMAARGLSGAAFNAAKEIALDHFIAGRIGFLDMAAVVEETLAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VHPQSIVHAMVGFCDGGLMAHLGPADMRHAIGFALNWPGR----GEVPVARIDLAQIASLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FRDWPVDRLKDVKVADALKHPNWNMGRKITVDSATLFNKGLEVIEAHYLFGAEYDDIEIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IALANKETLIAGGPFVLPLAHKHKVKILPADSEHSAIFQCIQGLSEGALRRIILTASGGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LALANKESLYTAGQLLMRTAQENGATILPVDSEHSAVFQALAGEDTACVERVIITASGGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KPISIVGSTGSIGTQTLDIVAE--NPDKFRVVALAAGSNVTLLADQVKTFKPKLVAVRNE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FRAPDNVKYPSMDLAYAAGRAGGTMTGVLSAANEKAVELFIDEKISYLDIFKVVELTCNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IHPQSIIHSMVETQDSSVLAQLGWPDMRLPILYTLSWPDRIYCSEVTWPRLDLCKLGSLT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             166;
                                                                                                                                                                         ) CARGILL
                                                                        Fig
                                                                                            of isoprenoids,
                                                                                                                                                      Jessen H,
                                                                                                                                                                                                                                                                                             diphosphate
                                                                                                                                                                                                                                                                                                                          related
                                                                                                                                                                                                                                                                                                      CoQ(10);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
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                                                                                                                                                                                                                                                                                                                                            (first
                                                                                                                                                                         INC
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                                                                                                                                                                                                                                                                                                                          protein
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                                                                                                                                                                                                                                                                                                                                             entry)
                                                                                                                                                                                                                                                                                                    1-deoxyxylulose-5-phosphate synthase;
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                                                                                                                                                      Zidwick
                                                                                                                                                                                                                                                                                             synthase
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                                                                          English.
                                                                                            especially CoQ(10)
                                                                                                                                                                                                                                                                                                                          sequence
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                                                                                                       for
                                                                                                                                                                                                                                                                                                       DXS;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              22;
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isoprehoids. More particularly the invention provides isolated nucleic acids, substantially pure polypeptides, host cells, and methods for producing various isoprehoid compounds. The polypeptides are useful for the production of isoprehoids, especially COQ(10). Expressing the pure polypeptides, which has 1 deoxyxylulose-5-phosphate synthase (DXS)

polypeptides, activity or d

decaprenyl

diphosphate

(DDS) activity,

useful for

for

The invention

relates to methods and

materials for

the production

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RESULT 12
AAB01362
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Matches 169;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local
Novel polynucleotide encoding isopentenyl diphosphate biosynthetic enzymes useful for producing transgenic plants with altered isopen diphosphate levels and for selecting polynucleotides affecting
                                                                                                                                                              03-DEC-1999;
                                                                                        Cahoon
                                                                                                                                       04-DEC-1998;
                                                                                                                                                                                     15-JUN-2000
                                                                                                                                                                                                             WO200034448-A1
                                                                                                                                                                                                                                   Oryza sativa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        increasing production of CoQ(10) in a cell having endogenous DDS activity. This sequence represents a protein relating to the isoprenoid production of the invention.
                                                                                                             (DUPO)
                                                                                                                                                                                                                                                          probe
                                                                                                                                                                                                                                                                       herbicide;
                                                                                                                                                                                                                                                                                1-deoxy-D-xylulose-5
                                                                                                                                                                                                                                                                                                     1-deoxy-D-xylulose-5|-phosphate reductoisomerase sequence
                                                                                                                                                                                                                                                                                                                                                                             AAB01362 standard;
                                                                                                                                                                                                                                                                                                                              16-NOV-2000
                                                                                                                                                                                                                                                                                                                                                      AAB01362;
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                                                                                                                                                                                                                                                                                                                                                                                                                                      364
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                                                  2000-431295/37
DB; AAA47405.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AARLEALLKRDGTATQVLHGAQALVDVASADEVSGVMCAIVGAVGLPSALAAAQKGKTIY
                                                                                                                                                                                                                                                                                                                                                                                                                                                            VSTDPLFGKVPDALEEVLAMDHLARRAAEEAAG
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GGPFLTADLNTFDSTTPDQAVKHPNWRMGRKISVDSATMMNKGLELIEAHWLFNCPPDKL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GGPFRDWSLERIRACTVAEAQAHPNWSMGQRISIDSASMFNKALELIETREFFGFEPDRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LANKETLVVSGALFMETARANGAAVLPVDSEHNAVFQVLPRDYTGRLNEHGIASIILTAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LPALREALA--GTGTEVAGGAQAIAEAADR-PADWTMSAIVGAAGLVPGMRALKHGRTLA 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LTILGSTGSTGESTLDVVSRH---PEKFRVFALAGHKQVEKLAAQCQTFHPEYAVVADAEH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FQKPDFDRFPCLKLAYEAMNAGGAAPCVLNAANEAAVAAFLDGQIKFTDIAKTVAHCLSQ
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                                                                                                             PONT
                                                                                                                                                                                                                                                                   rylulose-5|-phosphate reductoisomerase;
isopentenyl diphosphate; mapping; bre-
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                                                                                      Lee J,
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                                                                                                                                       98US-0110865
                                                                                                                                                              99WO-US28616
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                                                                                                               NEMOURS
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                                                                                                                                                                                                                                                                   mapping; breeding;
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                                                                                                                                                                                                                                                                              transgenic
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                                                                                                                                                                                                                                                                   phenotype;
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                                                                                                                                                                                                                                                                              plant;
             isopentenyl
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RESULT 13
AAY97197
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                                                                                                                                                                                                                                                                                          1-deoxy-D-xylulose-5-phosphate reductoisomerase; p
synthesis; metabolism; chlorophyll; terpenoid; ins
adhesive; ink; polymer; cytostatic; antiparasitic;
                                                                                                                                                                                                                                                                                                                                                                                                   A. thaliana
                                                                                                                                                                                                                                                                                                                                                                                                                                                       04-DEC-2000
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                                                                         27-JAN-2000; 2000WO-US02185
                                                                                                                                                                                     WO200046346-A1
                                                                                                                                                                                                                                      Arabidopsis thaliana
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              473 AA;
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Pred. No. 1.1e-66;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1-deoxy-D-xylulose-5-phosphate to isopentyl diphosphate, which in turn, is converted to a variety of molecules such as carotenoids, the prenyl side chains of chlorophyll, plastoquinone and tocopherols. The enzyme can therefore be used to enhance the production of chlorophyll, terpenoids,
22-FEB-2001
                        AAB11412;
                                                 AAB11412 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        for industrial use such as the synthesis of adhesives, inks and improve the yield of natural pigments extracted from plants for or culinary uses, and to enhance the yield of compounds having anti-cancer properties such as vitamin A and vitamin E.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           phytoalexins, toxins and deterrent compounds to improve defence against pathogens, insects and other herbivores, enhance the production of monoterpene flavour and aroma profiles, prepare synthetic intermediates for industrial use such as the synthesis of adhesives, inks and polymer;
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                                                                                                                                                              FKKPDNVKYPSMDLAYAAGRAGGTMTGVLSAANEKAVEMFIDEKISYLDIFKVVELTCDK
                                                                                                                                                                                                                                                             FRDWPVEKLKEVKVADALKHPNWNMGKKITVDSATLFNKGLEVIEAHYLFGAEYDDIEIV
                                                                                                                                                                                                                                                                                     FRDWSLERIRACTVAEAQAHPNWSMGQRISIDSASMFNKALELIETREFFGFEPDRIEAV
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                                                                                                                                                                                      FQKPDEERFPALRLARDVMAARGLSGAAFNAAKEIALDHFIAGRIGFLDMAAVVEETL--
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1-deoxy-D-xylulose-5-phosphate reducto-isomerase (II). The invention a describes plants with increased contents of tocopherols, Vitamin K, carotenoids, chlorophyll and pollyterpenes, produced by transformation with (I). (II) catalyzes conversion of D-1-deoxy-xylulose-5-phosphate 2-C-methyl-D-crythritol-4-phosphate, an essential starting material fc synthesis of all plastid isoprenoids, so over expression of (II) will the product of the p
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tocopherol; Vitamin K; carotenoid; chlorophyll; polyterpene;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A. thaliana DXPRI protein
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         This invention describes a novel DNA sequence (I) which encodes a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Disclosure; Page 35-37;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Lichtenthaler H,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tocopherol; Vitamin K; carotenoid; chlorophyll; polyter; 2-C-methyl-D-erythritol-4-phosphate; plastid isoprenoid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FRDWSLERIRACTVAEAQAHPNWSMGQRISIDSASMFNKALELIETREFFGFEPDRIEAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LALANKESLYTAGQLLMRTAQENGATILPYDSEHSAYFQALAGEDTACYERVIITASGGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KPISIVGSTGSIGTQTLDIVAE--NPDKFRVVALAAGSNVTLLADQVRRFKPALVAVRNE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DCLPALREALAGTG--TEVAGGAQATAEAADRP-ADWTMSAIVGAAGLVPGMRALKHGRT 118
-- AGVSTDPLFGKVPDALEEVLAMDHLARRAA
                                                                                                       FKKPDNVKYPSMDLAYAAGRAGGTMTGVLSAANEKAVEMFIDEKISYLDIFKVVELTCDK
                                                                                                                                                                                                    FQKPDEERFPALRLARDVMAARGLSGAAFNAAKEIALDHFIAGRIGFLDMAAVVEETL--
                                                                                                                                                                                                                                                                                                                       IHPQSIIHSMIETQDSSVLAQLGWPDMRLPILYTMSWPDRVPCSEVTWPRLDLCKLGSLT
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Pred. No. 9.6e-67;
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AAB01370
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                                                                                                                                                                                                                                                                       Query Match
Best Local
                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                                                                         Nucleic acids encoding 1-deoxy-D-xylulose-5-phosphate reductoisomerase are useful for creating transgenic plants with altered levels of plastid isopentenyl diphosphate in cells. The 1-deoxy-D-xylulose 5-phosphate reductoisomerase polypeptides are useful as targets for identifying inhibitors of the enzyme which are useful as herbicides! Nucleic acid fragments, of 1-deoxy-D-xylulose-5-phosphate reductoisomerase are useful as probes for genetically and physically mapping genes useful in plant breeding for developing lines with desired phenotypes.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Novel polynucleotide encoding isopentenyl diphosphate biosynthetic enzymes useful for producing transgenic plants with altered isopentenyl diphosphate levels and for selecting polynucleotides affecting expression of the enzyme
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               probe.
                                                                                                                                                                                                                                                                                                                  Sequence
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       04-DEC-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Example 3; Page 57-58; 63pp; English.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1-deoxy-D-xylulose-5;phosphate reductoisomerase; transgenic plant;
herbicide; isopentenyl diphosphate; mapping; breeding; phenotype;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 16-NOV-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAB01370 standard; Protein; 406 AA
                                188
                                                          179
239 VHPQSIVHAMVGFCDGGLMAHLGPADMRHAIGFALNWPGR----GEVPVARIDLAQIASLT
                                                                                      128
                                                                                                               119 LALANKESLYTAGQLLMRTAQENGATILPVDSEHSAVFQALAGEDTACVERVIITASGGP
                                                                                                                                                           10
                                                                                                                                           68 SLINELKEALADLDYKLETIPGEOGVIEVARHPEAVTVVTGIVGCAGLKPTVAAIEAGKD 127
                                                                                                                                                                                                                 FRDWSLERIRACTVAEAQAHPNWSMGQRISIDSASMFNKALELIETREFFGFEPDRIEAV
                                                                                                                                                                                                  KPISIVGSTGSIGTQTLDIVAE--NPDKFRVVALAAGSNVTLLADQVRRFKPALVAVRNE
                             FRDWPVEKLKEVKVADALKHPNWNMGKKITVDSATLFNKGLEVIEAHYLFGAEYDDIEIV
                                                                                   IALANKETLIAGGPFVLPLANKHNVKILPADSEHSAIFQCIQGLPEGALRKIILTASGGA 187
                                                                                                                                                                                                                                                          162;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2000-431295/37
                                                                                                                                                                                                                                                                       Similarity
                                                                                                                                                                                                                                                                                                                406 AA;
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                                                                                                                                                                                                                                                                      37.48;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Tao Y;
                                                                                                                                                                                                                                                         71;
                                                                                                                                                                                                                                                       Score 741.5; DB 21; Pred. No. 9.6e-67; 1; Mismatches 140;
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  295
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 368
                      354
                                           308
                                                                 296
                                                        FQKPDEERFPALRLARDVMAARGLSGAAFNAAKEIALDHFIAGRIGFLDMAAVVEETL---
                                                                                      HRNELVTSP
                     --AGVSTDPLFGKVPDALEEVLAMDHLARRAA 383
                                          FKKPDNVKYPSMDLAYAAGRAGGTMTGVLSAANEKAVEMFIDEKISYLDIFKVVELTCDK 367
-SLEEIVHYDLWAREYA 392
                                                                 353
                                                                                      307
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Search completed: April 15, 2003, 13:57:45 Job time : 39 secs

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OM protein - protein search, using sw model
                                                                                                    GenCore version 5.1.4_p5_4578 Copyright (c) 1993 - 2003 Compugen Ltd.
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Run on: April 15, 2003, 13:56:29 ; Search time 21 Seconds (without alignments) 1803.665 Million cell updates/sec

Title: Perfect score: Sequence: US-09-673-198-30
1984
1 MRSLSIFGATGSIGESTFDL.....MDHLARRAAEEAAGLRQQKR 394

Scoring table: BLOSUM62

Gapop 10.0 , Gapext 0.5

Searched: 283224 seqs, 96134422 residues

Total number of hits satisfying chosen parameters:

283224

Minimum DB seq length: 0
Maximum DB seq length: 200000000

Post-processing: Minimum Match 0% Maximum Match 100% Listing first 45 summaries

1: pir1:* 2: pir2:* 3: pir3:* 4: pir4:* PIR_73:*

Database :

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	. 12	11	10	9		7	5	ر ت	4	ω	2	1	No.	Result
596.5	598.5	608.5	611.5	617	628	631	640	670	673	682	693.5	695.5	702.5	707	708	717	725	732	733	733	740	741.5	743.5	750.5	775.5	899.5	994	994	Score	1
30.1	30.2	30.7	30.8	31.1	31.7	31.8	32.3	33.8	33.9	34.4	35.0	35.1	35.4	35.6	35.7	36.1	36.5	36.9	36.9	36.9	37.3	37.4	37.5	37.8	39.1	45.3	50.1	50.1	Match	Query
379	379	379	379	398	436	383	396	388	380	402	385	394	380	399	398	397.	398	398	398	398	396	406	394	394	396	399	397	397	Length I	
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G86533	C81578	A71562	G81712	F84957	A70923	C71304	F75388	в69881	AI1601	D82099	E97121	S76331	AE1239	AH2349	AF0529	A64014	AG0128 '	E64741	G85501	G90650	Н82728	T52570	в82000	A81229	E83188	н87486	AC2897	E97672	İb	
CT071 hypothetical	1-deoxy-D-xylulose	hypothetical prote	1-deoxy-D-xylulose	1-deoxy-D-xylulose	hypothetical prote	conserved hypothet,	1-deoxy-D-xylulose	conserved hypothet	deoxyxylulose 5-ph	1-deoxy-D-xylulose	1-deoxy-D-xylulose	hypothetical prote	deoxyxylulose 5-ph	deoxyxylulose 5-ph	. 1-deoxy-D-xylulose	conserved hypothet	1-deoxy-D-xylulose	yaeM protein - Esc	1-deoxy-D-xylulose	Description										

129 ANKECLVSAGDVFLRTVKQGGGRLIPVDSEHSAIFQCLTGEYKQAVERIVLTASGGPFRT 188

122 ANKESLYTAGQLLMRTAQENGATILPVDSEHSAVFQALAGEDTACVERVIITASGGPFRD 181

89

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362 309 302

366 -GRTAETMDDVFSADEEARRHALELIATKEK 395

FGKVPDALEEVLAMDHLARRAAEEAAGLRQQ 392

ARFPALRLARMALERGGLQGAALNAAEETAFHAFVAGGIGFLDMAEIVETVMDRMHD----

365

ERFPALRLARDVMAARGLSGAAFNAAKEIALDHFIAGRIGFLDMAAVVEETLAGVSTDPL 361

ALIGNMENTS

LAEMARALKAELAVTAHE 61	Qy 2 RSLSIFGATGSIGESTFDLVMRKGGPEAFRTVALTGGRNIRRLAEMARALKAELAVTAHE 61
Length 397; ; Indels 4; Gaps 1;	Query Match 50.1%; Score 994; DB 2; Length 397; Best Local Similarity 50.4%; Pred. No. 1.2e-63; Matches 197; Conservative 64; Mismatches 126; Indels
	A;Gene: AGR_C_4736 A;Gene: AGR_C_4736 A;Map position: circular chromosome C;Superfamily: conserved hypothetical protein HI0807
D:g15157812; GSPDB:GN00169	A;Molecule type: DNA A;Residues: 1-397 <kur> A;Cross-references: GB:AE007869; PIDN:AAK88334.1; PID:g15157812; GSPDB:GN00169</kur>
iotechnology Agent Agrobacterium	A; Title: Genome Sequence of the Plant Pathogen and Biotechnology Agent Agrobacterium A; Reference number: A97359; PMID:11743194 A; Accession: E97672 A; Status: preliminary
Blanchard, M.; Qurollo, B.; Goldm Scott, C.; Lappas, C.; Markelz,	C. Accession: E97672 R:Goodner, B.; Hinkle, G.; Gattung, S.; Miller, N.; Blanchard, M.; Qurollo, B.; Goldm A.; Liu, F.; Wollam, C.; Allinger, M.; Doughty, D.; Scott, C.; Lappas, C.; Markelz, Science 294, 2323-2328, 2001
reductoisomerase) [imported] - A text_change 11-Jan-2002	RESULT 1 E97672 E97672 C:Species: Agrobacterium tumefaciens C:Species: Agrobacterium tumefaciens C:Date: 30-Sep-2001 #sequence_revision 30-Sep-2001 #text_change 11-Jan-2002

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R;Nierman, W.C.; Feldblyum, T.V.; Paulsen, I.T.; Nelson, K.E.; Eisen, J.; Heidelberg, B.; Laub, M.T.; DeBoy, R.T.; Dodson, R.J.; Durkin, A.S.; Gwinn, M.L.; Haft, D.H.; Kon, J.; Ermolaeva, White, O.; Salzberg, S.L.; Shapiro, L.; Venter, J.C.; Fraser, C. Proc. Natl. Acad. Sci. U.S.A. 98, 4136-4141, 2001

A;Title: Complete Genome Sequence of Caulobacter crescentus.

A;Reference number: A87249; MUID:21173698; PMID:11259647
                                                                                                                                 1-deoxy-D-xylulose 5-phosphate reductoisomerase [imported] - Caulobacter cr
C;Species: Caulobacter crescentus
C;Date: 20-Apr-2001 #sequence_revision 20-Apr-2001 #text_change 10-May-2001
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A; Molecule type: DNA
A; Residues: 1-397 <KUR>
A; Cross-references: GB:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A:Reference number: AB2577; PMID:11743193
A:Recession: AC2897
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       R:Wood, D.W., Setubal, J.C.; Kaul, R.; Monks, erage, G.; Gillet, W.; Grant, C.; Guenthner, Karp, P.; Romero, P.; Zhang, S. Science 294, 2317-2323, 2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1-deoxy-D-xylulose 5-phosphate reductoisomerase [imported] - Agrobacterium tumefaciens C;Species: Agrobacterium tumefaciens C;Date: 11-Jan-2002 #sequence_revision 11-Jan-2002 #text_change 01-Feb-2002 C;Accession: AC2897
                                                                                                                    C; Accession:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A; Map position:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; Authors: Yoo, H.; Tao,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A; Molecule
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A;Status: preliminary
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                                                                                                                                                                                                                                                                                                                                                                                                                   QSIVHAMVGFCDGGLMAHLGPADMRHAIGFALNWPGRGEVPVARIDLAQIASLTFQKPDE 301
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                                                                                                                                                                                                                                                                                                                          ARFPALRLARMALERGGLQGAALNAAEETAFHAFVAGGIGFLDMAEIVETVMDRMHD---
                                                                                                                                                                                                                                                                                                                                                             ERFPALRLARDVMAA'RGLSGAAFNAAKEIALDHFIAGRIGFLDMAAVVEETLAGVSTDPL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                WSLERIRACTVAEAQAHPNWSMGQRISIDSASMFNKALELIETREFFGFEPDRIEAVVHP
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                                                                                                                                                                                                                                                           -GRTAETMDDVFSADEEARRHALELIATKEK 395
                                                                                                                                                                                                                                                                                        FGKVPDALEEVLAMDHLARRAAEEAAGLRQQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WSRDEMSNVTADIARAHPNWSMGLKVSIGSASMFNKGLEMIEAKYLFDLRPDQVDVIVHP
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number:
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conserved
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strain C58 (Dupont)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           chromosome
hypothetical protein HI0807
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Y.; Biddle, P.; Jung, M.; Krespan, W.; Perry, M.; Gordon-Kamm
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ; Score 994; DB 2; I; pred. No. 1.2e-63; 64; Mismatches 126;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       D.; Chen, L.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PID:g17741111;
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[.; Levy, R.; Li,
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                                                                                                                   Matches
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A;Molecule type: DNA
A;Residues: 1-399 <STO>
A;Cross-references: GB:AE005673; NID:g13423370; PIDN:AAK23892.1; GSPDB:GN00148
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366 LSVAESDAVETAMLIDGSARRIAAEVVAQKRQR 398
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                                       LFGKVPDALEEVLAMDHLARRAAEEAAGLROOK
                                                                             ERFPAIGIAREALRLGGGAPAAMNAANEVAVAAFLDRRIGFLDIAGAVAGTLERMNSLGD
                                                                                                                   ERFPALRLARDVMAARGLSGAAFNAAKEIALDHFIAGRIGFLDMAAVVEETLAGV-STDP
                                                                                                                                                           QSVIHSLVEYVDGSTLAQLGPPDMRAPIACAFAWPDRLPWPAPRLDLAAYGQLTFESPDV
                                                                                                                                                                                                 QSIVHAMVGFCDGGLMAHLGPADMRHAIGFALNWPGRGEVPVARIDLAQIASLTFQKPDE 301
                                                                                                                                                                                                                                       WDKAAMARATPEQAIAHPNWSMGAKISVDSATMMNKGLEMIEASYLFATPEDRVDVVIHP
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                                                                                                                                                                                                                                                                                                                                                            ANKESLYTAGQLLMRTAQENGATILPVDSEHSAVFQALAGEDTACVERVIITASGGPFRD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RKVVVLGSTGSTGLSTLSLFEESGAP---VQILALTAGRNVERLIEQARRWKPSLAVIEDE
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2; Mismatches
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                                          393
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C; Species: Pseudomonas aeruginosa C; Date: 15-Sep-2000 #sequence_revision 1-deoxy-d-xylulose 5-phosphate reductoisomerase PA3650 [imported] 15-Sep-2000 #text_change 31-Dec-2000

Pseudomonas

aerug

R;Stover, C.K.; Pham, X.Q.; adman, S.; Yuan, Y.; Brody, .; Lory, S.; Olson, M.V. Nature 406, 959-964, 2000 Erwin, A.L.; Mizoguchi, S.D.; Warrener, L.L.; Coulter, S.N.; Folger, K.R.; Kas, Α°.; Hickey, Larbig, X . . .

A;Title: Complete genome see A;Reference number: A82950; A;Accession: E83188 sequence of Pseudomonas aeruginosa (i); MUID:20437337; PMID:10984043 PA01, an opportunistic

рa

A;Status: preliminary

A; Nolecule type: DNA A; Molecule type: DNA A; Residues: 1-396 <STO> A; Cross-references: GB: AE004785; GB: AE004091; NID: g9949809; PIDN: AAG07038.1; A; Cross-references: Strain PAO1 GSPDB:GN

PA3650

Similarity conserved hypothetical protein HI0807 39.1%; 73; Score 775.5; DB Pred. No. 5e-48; 3; Mismatches 1 DB 2; 134; Indels Length 15;

Conservative

Gaps

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LSIFGATGSIGESTFDLVMRKGGPEAFRTVALTGGRNIRRLAEMARALKAELAVTAHEDC

64 LPALREALAGTG--TEVAGGAQAIAEAADRP-ADWTMSAIVGAAGLVPGMRALKHGRTLA 120

ISVLGATGSIGLSTLDVVQRH--PDRYEAFALTGFSRLAELEALCLRHRPVYAVVPEQAA 64

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Hickey, E.K.; Haft, D.H.; Salzberg, S.L.; White, D.; Fleischmann, R.D.; Dougherty, B.A.
ri, H.; Qin, H.; Vamathevan, J.; Gill, J.; Scarlato, V.; Masignani, V.; Pizza, M.
Science 287, 1809-1815, 2000
A;Authors: Grandi, G.; Sun, L.; Smith, H.O.; Fraser, C.M.; Moxon, E.R.; Rappuoli, R.; Ve
A;Title: Complete genome sequence of Neisseria meningitidis serogroup B strain MC58.
A;Reference number: A81000; MUID:20175755; PMID:10710307
A;Accession: A81229
A;Status: preliminary
A;Molecule type: DNA
A;Residues: 1-394 <TET>
A;Cross-references: GB:AE002375; GB:AE002098; NID:97225394; PIDN:AAF40641.1; PID:9722540
A;Experimental source: serogroup B, strain MC58
C;Genetics:
A;Gene: NMB0184
C;Superfamily: conserved humania.
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C; Date: 31-Mar-20
C; Accession: A81:
R; Tettelin, H.;
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                                                                                                                                                                             GGPFRDWSLERIRACTVAEAQAHPNWSMGQRISIDSASMFNKALELIETREFFGFEPDRI
                                                                                                                                                                                                                                                      LANKESLYTAGQLLMRTAQENGATILPYDSEHSAVFQAL----AGE-DTACVERVIITAS.
                                                                                                                                                                                                                                                                                                             AARLEALLKRDGTATQVLHGAQALVDVASADEVSGVMCAIVGAVGLPSALAAAQKGKTIY
                                                                                                                                                                                                                                                                                                                                                   LPALREALA--GTGTEVAGGAQAIAEAADR-PADWTMSAIVGAAGLVPGMRALKHGRTLA 120
                                                                                                                                                                                                                                                                                                                                                                                      LSIFGATGSIGESTFDLVMRKGGPEAFRTVALTGGRNIRRLAEMARALKAELAVTAHEDC
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    FOKPDFDRFPCLRLAYEAMNAGGAAPCVLNAANEAAVAAFLDGQIKFTDIAKTVAHCLAQ
                                      FQKPDEERFPALRLARDVMAARGLSGAAFNAAKEIALDHFIAGRIGFLDMAAVVEETLAG
                                                                            EVVIHPQSVIHSMVRYRDGSVLAQLGNPDMRTPIAYCLGLPERIDSGVGDLDFDALSALT
                                                                                                                 EAVVHPQSIVHAMVGFCDGGLMAHLGPADMRHAIGFALNWPGRGEVPVARIDLAQIASLT
                                                                                                                                                         GGPFLTADLNTFDRITPAQAVKHPNWRMGRKISVDSATMMNKGLELIEAHWLFNCPPDKL
                                                                                                                                                                                                                                  LANKETLYVSGALFMETARANGAAVLPVDSEHNAVFQVLPRDYAGRLNEHGIASIILTAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FQRPDEQRFPCLRLASQAAETGGSAPAMLNAANEVAVAAFLERHIRFSDIAVIIEDVLNR
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                       al Similarity
173; Conserv
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44.0%;
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Pred. No. 3.1e:
55; Mismatches
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hes 150;
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B82000
                              R;Schwender, J.; Muller, C.; Zeidler, J.; Lic
FEBS Lett. 455, 140-4, 1999
A;Title: Cloning and heterologous expression
A;Reference number: Z25204; MUID:99355442; PM
                                                                                                             1-deoxy-d-xylulose-5-phosphate reductoisomerase [imported] - C;Species: Arabidopsis thaliana (mouse-ear cress) C;Date: 24-Oct-2000 #sequence_revision 24-Oct-2000 #text_chan C;Accession: T52570
                                                                                                                                                                                              RESULT
T52570
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C; Superfamily: conserved hy
C; Keywords: oxidoreductase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1-deoxy-D-xylulose 5-phosphate reductoisomerase C;Species: Neisseria meningitidis C;Date: 05-May-2000 #sequence_revision 05-May-20
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A; Status: pr
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Title: Complete DNA sequence of a serogroup A strain of A; Reference number: A81775; MUID: 20222556; PMID: 10761919
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Nature 404, 502-506,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  4 LSIFGATGSIGESTFDLVMRKGGPEAFRTVALTGGRNIRRLAEMARALKAELAVTAHEDC
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AARLEALLKRDGTATQVLHGAQALVDVASADEVSGVMCAIVGAVGLPSALAAAQKGKTIY 123
                                                                                                                                                                                                                                                                                                             VSTDPLFGKVPDALEEVLAMDHLARRAAEEAAG
                                                                                                                                                                                                                                                                                                                                                                                                                            EAVVHPQSIVHAMVGFCDGGLMAHLGPADMRHAIGFALNWPGRGEVPVARIDLAQIASLT | |:||||::|:| ::|| | ::|| | ::|| | ::|| | ::|| | ::|| | ::|| | ::|| | ::|| | ::|| | ::|| | ::||
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                                                                                                                                                                                                                                                                                                                                                   FQKPDFDRFPCLKLAYEAMNAGGAAPCVLNAANEAAVAAFLDGQIKFTDIAKTVAHCLSQ
                                                                                                                                                                                                                                                                                                                                                                                          FQKPDEERFPALRLARDVMAARGLSGAAFNAAKEIALDHFIAGRIGFLDMAAVVEETLAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GGPFLTADLNTFDSITPDQAVKHPNWRMGRKISVDSATMMNKGLELIEAHWLFNCPPDKL
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          169;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1-394 <PAR>
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translated
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Pred. No. 9.7e-46;
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from
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S.; Moule, S.;
                                                                                               J.; Lichtenthaler, H.K.
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                                                        cDNA encoding
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Mungall, K.; Quail,
                                                                                                                                     #text_change
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183

Klee,

S.R.; Mo Rajandre

Nei

1-deoxy-D-xylulose-5

08-Dec-2000

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A; Molecule type: DNA
A; Residues: 1-396 <SIM>A; Residues: 1-396 <SIM>A; Residues: 1-396 <SIM>A; Residues: 1-396 <SIM>A; Cross-references: GB:AE003942; GB:AE003849; NID:g9105990; PIDN:AAF83858.1; GSPDB:GN001
A; Experimental source: strain 9a5c
R; Simpson, A.J.G.; Reinach, F.C.; Arruda, P.; Abreu, F.A.; Acencio, M.; Alvarenga, R.; ABriones, M.R.S.; Bueno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M.; Carrer, H. Briones, M.R.S.; Bueno, M.R.P.; Camargo, A.A.; Ferreira, A.J.S.
submitted to GenBank, June 2000
A; Anthors: Ferreira, V.C.A.; Ferro, J.A.; Fraga, J.S.; Franca, S.C.; Franco, M.C.; Frohm J.D.; Junqueira, M.L.; Kemper, E.L.; Kitajima, J.P.; Krieger, J.E.; Kuramae, E.E.; Laigr Chado, M.A.; Madeira, A.M.; Madeira, H.M.F.; Marino, C.L.; Marques, M.V.; Martins, F.G.; Nunes, L.R.; Oliveira, M.A.; de Oliveira, M.C.; de Oliveira, R.C.; Palmieri, D.A. Rodrigues, V.; Rosa, A.J. (de M.; de Rosa Jr., V.E.; de Sa, R.G.; Santelli, R.V.; Sawasak, A; Mathors: da Silva, A.C.R.; da Silva, F.R.; da Silva, A.M.; Silva Jr., W.A.; da Silveira, M.S.; Vertore, A.L.; Z., A; Reference number: A59328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Molecule type: mRNA
A; Residues: 1-406 < SCH>
A; Cross-references: EMBL
A; Experimental source: C
C; Genetics:
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A;Title: The genome squeence of the plant pathogen Xylella fastidiosa. A;Reference number: A82515; MUID:20365717; PMID:10910347

A;Note: for a complete list of authors see reference number A59328 bel A;Accession: H82728
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1-deoxy-p-xylulose 5-phosphate reductoisomerase XF1048 [imported] - Xylella C;Species: Xylella fastidiosa C;Date: 18-Aug-2000 #sequence_revision 20-Aug-2000 #text_change 02-Sep-2000 C;Accession: H82728
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C; Superfamily:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A;Status: preliminary
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1.4e-45;
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                TDPLFGKVPDALEEVLAMDHLARRAAEEA
                                                      RPDTETFSCLRLARDAMQTGGTAPAVLNAANEIAVSAFLQGRIGFLTIPALIEHAL---T
                                                                                   KPDEERFPALRLARDVMAARGLSGAAFNAAKEIALDHFIAGRIGFLDMAAVVEETLAGVS
                                                                                                                                        VVHPQSIVHAMVGFCDGGLMAHLGPADMRHAIGFALNWPGRGEVPVARIDLAQIASLTFQ
                                                                                                                                                                      PFRGHNRTMLAKITPTQAMAHPTWSMGPKISVDSATLMNKGLEVIEAHHLFGLPSEQIDV
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                                                                                                              LVHPQSLVHSLVEFIDGSTLAQLSLPDMRTTLAVGLSWPERIGSGVPGLDLMKHNRLDFE
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Pred. No. 1.7e-45;
0; Mismatches 154
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A; Gene: C; Superf RESULT G90650 δÃ A;Cross-references: GB:BA000007; PIDN:BAB33598.1; PID:g13359631; A;Experimental source: strain 0157:H7, substrain RIMD 0509952 A; Molecule type: DNA A; Residues: 1-398 <HAY> DNA Res. 8, 11-22, 2001 A;Title: Complete genome sequence of enterohemorrhagic Escherichia coli O157:H7 A;Reference number: A99629; MUID:21156231; PMID:11258796 A;Accession: G90650 1-deoxy-D-xylulose 5-phosphate reductoisomerase [imported] C; Species: Escherichia coli A; Status: preliminary gasawara, N.; Yasunaga, R;Hayashi, C; Accession: G90650 C;Date: 18-Jul-2001 #sequence_revision 18-Jul-2001 #text_change 03-Aug-2001 Superfamily: conserved hypothetical protein HI0807; Matches Query Match Local Similarity ECs0175 MRSLSIFGATGSIGESTFDLVMRKGGPEAFRTVALTGGRNIRRLAEMARALKAELAVTAH Makino, K.; Ohnishi, Yasunaga, T.; Kuhara, Conservative Ŧ.; 36.98; 40.78; 72; Score 733; DB 2; Pred. No. 5.5e-45; S :: Mismatches 144; Kurokawa, K.; Shiba, T.; Ha: K.; Ishii, K.; Hattori, M.; Length Indels Escherichia coli Shinagawa, 20; GSPDB:GN00154 Gaps 60 5 (strain Han, a

118 119

TILLANKESLVTCGRLFMDAVKQSKAQLLPVDSEHNAIFQSLPQPIQHNLGYADLEQNGV

TLALANKESLVTAGQLLMRTAQENGATILPVDSEHSAVFQAL--

-AGEDTACV 167

61 59

EDCLPALREAL--AGTGTEVAGGAQAIAE-AADRPADWTMSAIVGAAGLVPGMRALKHGR 117

MKQLTILGSTGSIGCSTLDVV--RHNPEHFRVVALVAGKNVTRMVEQCLEFSPRYAVMDD

58

EASAKLLKTMLQQQGSRTEVLSGQQAACDMAALEDVDQVMAAIVGAAGLLPTLAAIRAGK

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A:Cross-references: GB:AE005174; NID:g12512898; PIDN:AAG54475.1; A:Experimental source: strain O157:H7, substrain EDL933 C;Genetics: A;Gene: yaeM C;Superfamily: conserved hypothetical protein HI0807
RESULT
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A; Residues: 1-398 <S'
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C;Species: Escherichia coli
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Date: 16-Feb-2001 #sequence_revision 16-Feb-2001 #text_change 02-Nov-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches 162;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  359
                                                                                                       359 LNLSVL----
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MKQLTILGSTGSIGCSTLDVV--RHNPEHFRVVALVAGKNVTRMVEQCLEFSPRYAVMDD
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                                                                                                             -EKMDMREPQCVDDVLSVDASAREVARK 391
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         72; Mismatches 144;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 733; DB 2;
Pred. No. 5.5e-45;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GSPDB:GN00145;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT
AG0128
                                                                                                                                                                                          A; Title: Genome sequence of Yersinia pestis, the causative agent A; Reference number: AB0001; MUID:21470413; PMID:11586360
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C;Accession:
                                                                                                                                                                                                                                               il, M.; Rutherford, K.; Simmonds, M.;
Nature 413, 523-527, 2001
                                                                                                                                                                                                                                                                                                     deno-Tarraga, A.M.; Chillingworth, T.;
                                                                                                                                                                                                                                                                                                                                                                   C; Accession:
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A; Residues: 1-398 <BLAT>
                                                  A; Cross-references: GB: AL590842; PIDN: CAC89890.1;
                                                                          A; Residues:
                                                                                                    A; Molecule type: DNA
                                                                                                                                  A; Status: preliminary
                                                                                                                                                             A; Accession: AG0128
                                                                                                                                                                                       A; Reference number: AB0001;
                                                                                                                                                                                                                                                                                                                                  R; Parkhill, J.;
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Best Local
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                                                                          1-398 <KUR>
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C;Superfamily: conserved hypothetical protein HI0807 C;Keywords: nucleotide binding; P-loop F;112-119/Region: nucleotide-binding motif A (P-loop)
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A;Title: The complete genome sequence of Escherichia coli
A;Reference number: A64720; MUID:97426617; PMID:9278503
                                                                                                             C;Species: Yersinia pestis
C;Date: 02-Nov-2001 #sequence_revision 02-Nov-2001 #text_change 27-Nov-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            R;Blattner, F.R.; Plunkett III, G.; Bloch, C.A.; A.; Rose, D.J.; Mau, B.; Shao, Y.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A;Cross-references: GB:AE000126; GB:U00096; NID:g1786358; A;Experimental source: strain K-12, substrain MG1655
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Status: nucleic acid sequence not shown;
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                                                                                                                                                                    l-deoxy-D-xylulose 5-phosphate reductoisomerase (EC 1.1.1.-) [imported] - Yersinia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Species: Escherichia coli; Date: 12-Sep-1997 #sequence_revision 17-Sep-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      118 TLALANKESLVTAGQLLMRTAQENGATILPVDSEHSAVFQAL------AGEDTACV
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                                                                                                                                                                                                                                                                                                                                                                                                                            299 FCKLSALTFAAPDYDRYPCLKLAMEAFEQGQAATTALNAANEITVAAFLAQQIRFTDIAA
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                                                                                                                                                                                                                                                                                                                  LNLSVL----EKMDMREPQCVDDVLSVDANAREVARK 391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FNASASQMEVLIHPQSVIHSMVRYQDGSVLAQLGEPDMRTPIAHTMAWPNRVNSGVKPLD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FGFEPDRIEAVVHPQSIVHAMVGFCDGGLMAHLGPADMRHAIGFALNWPGRGEVPVARID
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EDCLPALREAL -- AGTGTEVAGGAQAIAE - AADRPADWTMSAIVGAAGLVPGMRALKHGR 117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MKQLTILGSTGSIGCSTLDVV--RHNPEHFRVVALVAGKNVTRMVEQCLEFSPRYAVMDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LAQIASLTFQKPDEERFPALRLARDVMAARGLSGAAFNAAKEIALDHFIAGRIGFLDMAA 347
                                                     Wren, B.W.; Thomson, N.R.; Titball, R.W.; Holden, M.T.G.; Prentice,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
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40.78;
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Pred. No. 6.5e-45
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; Cronin, A.;
Skelton, J.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       translation
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                             Davies, R.M.;
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Whitehead, S.; Barr
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PID:g15979115;

GSPDB:GN00175

Stevens, K.;

Barrel

of plague

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RESULT 13
A64014
conserved hypothetical protein HI0807 - Haemophilus influenzae (strain Rd KW20).
C;Species: Haemophilus influenzae
C;Date: 18-Aug-1995 #sequence_revision 18-Aug-1995 #text_change 29-Sep-1999
C;Accession: A64014
R;Fleischmann, R.D.; Adams, M.D.; White, O.; Clayton, R.A.; Kirkness, E.F.; Kerlavage, Gocayne, J.D.; Scott, J.; Shirley, R.; Liu, L.I.; Glodek, A.; Kelley, J.M.; Weidman, D.M.; Brandon, R.C.; Fine, L.D.; Fritchman, J.L.; Fuhrmann, J.L.; Geoghagen, N.S.M. A;Authors: Gnehm, C.L.; McDonald, L.A.; Small, K.V.; Fraser, C.M.; Smith, H.O.; Venter, A;Authors: Gnehm, C.L.; McDonald, L.A.; Small, K.V.; Fraser, C.M.; Smith, H.O.; Venter, A;Title: Whole-genome random sequencing and assembly of Haemophilus influenzae Rd. A;Reference number: A64000; MUID:95350630; PMID:7542800
                                                                                     Db
                                                                                                                  9
                                                                                                                                                                                                                                                                 A;Molecule type: DNA
A;Residues: 1-397 <TIGR> |
A;Cross-references: GB:U32763; GB:L42023; NID:g1573817;
C;Superfamily: conserved hypothetical protein HI0807
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Best Local s
Matches 162
                                                                                                                                                                                                                               Query Match
Best Local
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Keywords: oxidoreductase
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                                                   LALANKESLYTAGQLLMRTAQENGATILPVDSEHSAVFQALAGE-------DTACVE
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QNIVILGSTGSIGKSTLSVI--ENNPQKYHAFALVGGKNYEAMFEQCIKFRPHFAALDDV
RVIITASGGPFRDWSLERIRACTVAEAQAHPNWSMGQRISIDSASMFNKALELIETREFF
                           VLLANKESLYTCGQLF|IDAVKNYGSKLLPYDSEHNAIFQSLPPEAQEKIGFCPLSELGVS
                                                                                        NAAKILREKLIAHHIPTEVLAGRRAICELAAHPDADQIMASIVGAAGLLPTLSAVKAGKR 121
                                                                                                                 DCLPALREALAG--TGTEVAGGAQAIAEAADRP-ADWTMSAIVGAAGLVPGMRALKHGRT 118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VVEETLAGVSTDPLFGKVPDALEEVLAMDHLARRAAEE 385
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162; Conserv
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Similarity | 40.2%;
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                                                                                                                                                                                                              Score 717; DB 2;
Pred. No. 7.7e-44;
72; Mismatches 145
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Pred. No. 2.1e-44;
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                             L---NLAVLERMDL--HEPASVDDVLQVDAIAREVARK
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l-deoxy-D-xylulose 5-phosphate reductoisomerase (EC 1.1.1.-) [imported] - C;Species: Salmonella enterica subsp. enterica serovar Typhi A;Note: this species has also been called Salmonella typhi C;Date: 09-Nov-2001 #sequence_revision 09-Nov-2001 #text_change 27-Nov-200C;Accession: AF0529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A;Gene: dxr
C;Superfamily: conserved hypothetical protein HI0807
C;Keywords: oxidoreductase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Authors: Parry, C.; Quail, M.; Rutherford, K.; A;Title: Complete genome sequence of a multiple c A;Reference number: AB0502; PMID:11677608 A;Accession: AF0529
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               R;Parkhill, J.; Dougan, G.; James, th, T.; Connerton, P.; Cronin, A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A; Cross-references: GB: AL513382;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A; Molecule type: DNA
A; Residues: 1-398 <P
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Nature 413, 848-852, 2001
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VVEETLAGVSTDPLFGKVPDALEEVLAMDHLARRAAEE
                                                         FCKLSALTFSAPDYQRYPCLKLAMEAFEQGQAATTALNAANEITVAAFLAQQIRFTDIAG
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Pred. No. 3.4e-43;
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A;TitLe: Complete Genomic Sequence of the Filamentous Nitrogen-fixing Cyanobacterium An
A;Reference number: AB1807; MUID:21595285; PMID:11759840
Search completed: April 15, 2003, 13:58:13
Job time: 23 secs
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A;Residues: 1-399 <KUR>
A;Cross-references: GB:BA000019; PIDN:BAB76050.1; PID:g17133487; GSPDB:GN00179
A;Experimental source: strain PCC 7120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Reference number: AB1807; A; Accession: AH2349
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A;Note: Nostoc sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 C;Date: 14-Dec-2001 #sequence_revision 14-Dec-2001 #text_change 30-Jun-2002
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                                                                                                      360 ND---NCANPSLDDILAADQWARQ 380
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1.; Shimpo, S.; Sugimoto, M.; Takazawa, M.; Yamada, M.; Yasuda, M.; Tabata, S
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Query Match 51.6%; Score 1024; DB 1; Length 391; Best Local Similarity 53.9%; Pred. No. 4.2e-65; Matches 207; Conservative 60; Mismatches 113; Indels 4; Gaps 1;	EMBL; AL591792; CAC47567.1; InterPro; IPR003821; DXP_redisomrase. Pfam; PF02670; DXP_reductoisom; 1. TIGREAMS; TIGR00243; DXX; 1. Isoprene biosynthesis; Oxidoreductase; NADP; Complete proteome. NP_BIND 14 21 NADPH (POTENTIAL). SEQUENCE 391 AA; 41741 MW; 28D36CD8F026757D CRC64;	This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entitles requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).	Sinorhizobium meliloti strain 1021."; Proc. Natl. Acad. Sci. U.S. A. 98:9877-9882(2001).	Bacteria; ProteobdCteria; alpha subdivision; Rhizobiaceae group; Rhizobiaceae; Sinorhizobium. NCBI_TaxID-382; [1] SEQUENCE FROM N.A. STRAIN-1021; MEDLINE-21396507; PubMed=11481430; MEDLINE-21396507; PubMed=11481430; Capela D., Barloy-Hubler F., Gouzy J., Bothe G., Ampe F., Batut J., Boistard P., Becker A., Boutry M., Cadieu E., Dreano S., Gloux S., Godrie T., Goffeau A., Kahn D., Kiss E., Lelaure V., Masuy D., Pohl T., Portetelle D., Puehler A., Purnelle B., Ramsperger U., Renard C., Thebault P., Vandenbol M., Weidner S., Galibert F.; "Analysis of the chromosome sequence of the legume symbiont	DXR_RHIME STANDARD; PRT; 391 AA. AC Q92LP6; AC Q92LP6; DT 15-JUN-2002 (Rel. 41, Created) DT 15-JUN-2002 (Rel. 41, Last sequence update) DT 15-JUN-2002 (Rel. 41, Last anotation update) DT 1-deoxy-D-xylulose 5-phosphate reductoisomerase (EC 1.1.1.267) (DXP DE Treductoisomerase) (1-deoxyxylulose-5-phosphate reductoisomerase). GN R0298 OR SMC03105. GN R0120bium meliloti (Sinorhizobium meliloti).

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MOOD D.W., Setubal J.C., Kaul R., Monks D.E., Almeida N.F. Jr., Woo L.

Okura V.K., Zhou Y., Chen L., Wood G.E., Almeida N.F. Jr., Woo L.

Chen Y., Paulsen I.T., Eisen J.A., Karp P.D., Bovee D. Sr.,

Chapman P., Clendenning J., Deatherage G., Gillet W., Grant C.,

Kutyavin T., Levy R., Li M.-J., McClelland E., Palmieri A.,

Kutyavin T., Levy R., Li M.-J., McClelland E., Palmieri A.,

Raymond C., Rouse G., Saenphimmachak C., Wu Z., Romero P., Gordc

Zhang S., Yoo H., Tao Y., Biddle P., Jung M., Krespan W., Perry

Gordon-Kamm B., Liao L., Kim S., Hendrick C., Zhao Z.-Y., Dolan

Chumley F., Tingey S.V., Tomb J.-F., Gordon M.P., Olson M.V.,
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15-JUN-2002 (Rel. 41, Last annotation update)
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PATHWAY: Nonmevalonate terpenoid biosynthesis pathway; sec
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303 MW; 0A24C408C2D47094 CRC64;
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64; Mismatches
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SEQUENCE FROM N.A.
STRAIN-ATCC 19089 / CB15;
MEDLINE-21173698; PubMed-11259647;
Nierman W.C., Feldblyum T.V., Laub
Eisen J., Heidelberg J.F., Alley M
                                                                            Bacteria; Proteobacteria; Caulobacter.
                                                                                                  Caulobacter crescentus
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1- FUNCTION: Catalyzes the NADP-dependent rearrangement and reduction of 1-deoxy-D-xylulose-5-phosphate (DXP) to 2-C-methyl-D-erythritol 4-phosphate (MEP) (By similarity).

1- CARALYTIC ACTIVITY: 2-C-methyl-D-erythritol 4-phosphate + NADPH.

1- PARHWAY: Nonmevalonate terpenoid biosynthesis pathway; second
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
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Pfam; PF02670; DXP_re
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Bacteria;
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CONFLICT
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                                                                                                                                                                                                                                                                                                                                                                                                      use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entitles requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Lee H.J., Kang H.S.;
Submitted (JAN-1999) to the EMBL/GenBank/DDBJ databases.
-i- FUNCTION: Catalyzes the NADP-dependent rearrangement of 1-deoxy-D-xylulose-5-phosphate (DXP) to 2-C-methy
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"Isolation of the dxr gene of Eymomonas mobilis and characterization of the 1-deoxy-D-xylulose 5-phosphate reductoisomerase:";
FEMS Microbiol. Lett. 191:131-137(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A., AND CHARACTERIZATION STRAIN-ATCC 31821 / ZM4 / CP4; MEDLINE-20461176; PubMed-11004410;
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                                                                                                                                                                                             SEQUENCE
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SIMILARITY: BELONGS TO THE DXR FAMILY.
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ANKESLVSAGGLMIDAVREHGTTLLPVDSEHNAIFQCFPHHNRDYVRRIIITASGGPFRT

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A Ralat M., Billault A., Brottier P., Camus J.C., Cattolico L.,
A Ralat M., Billault A., Brottier P., Camus J.C., Cattolico L.,
Chandler M., Choisne N., Claudel-Renard C., Cunnac S., Demange N.,
Chandler M., Choisne N., Moisan A., Robert C., Saurin W., Schiex T.,
A Gaspin C., Lavie M., Moisan A., Robert C., Saurin W., Schiex T.,
A Siguier P., Thebault P., Whalen M., Wincker P., Levy M.,
Welssenbach J., Boucher C.A.;
Tenome sequence of the plant pathogen Ralstonia solanacearum.";
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15-JUN-2002 (Rel. 41, Last sequence update)
15-JUN-2002 (Rel. 41, Last sequence update)
15-JUN-2002 (Rel. 41, Last annotation update)
1-deoxy-D-xylulose 5-phosphate reductoisomerase (EC 1.1.1.267)
1-deoxy-D-xylulose 5-phosphate reductoisomerase
15-JUN-2002 (Rel. 41, Last sequence update)
16-JUN-2002 (Rel. 41, Last sequence update)
16-JUN-200
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     InterPro; IPR003821; DXP_redisor
Pfam; PF02670; DXP_reductoisom;
TIGRFAMs; TIGR00243; Dxr; 1.
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                                                                                                                                                                              1 MRSLSIFGATGSIGESTFDLYMRKGGPEAFRTVALTGGRNIRRLAEMARALKAELAVTAH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SIMILARITY: BELONGS TO THE DXR FAMILY.
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EDCLPALREALA--GTGTEVAGGAQAIAEAADRP-ADWTMSAIVGAAGLVPGMRALKHGR
                                                                                                                                    MMRITVLGATGSIGDSTLDVVRRH--PDRYRVFALTANTQVDKLAALCRVFRPAMAVVGS
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                                                                                                                                                                                                                                                                                                                                                                Score 797.5; DB 1
Pred. No. 3.6e-49;
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STRAIN-ATCC 15692 / PAO1;

MEDLINE-20437337; PubMed-10984043;

MEDLINE-20437337; PubMed-10984043;

Stover C.K., Pham X.-Q.T., Erwin A.L., Mizoguchi S.D., Warrener P., Stover C.K., Brinkman F.S.L., Hufnagle W.O., Kowalik D.J., Lagrou M. Garber R.L., Goltry L., Tolentino E., Westbrock-Wadman S., Yuan Y., Brody L.L., Coulter S.N., Folger K.R., Kas A., Larbig K., Lim R.M., Smith K.A., Spencer D.H., Wong G.K.-S., Wu Z., Paulsen I.T., Smith K.A., Spencer D.H., Wong G.K.-S., Wu Z., Paulsen I.T., Reizer J., Saier M.H., Hancock R.E.W., Lory S., Olson M.V.;

"Complete genome sequence of Pseudomonas aeruginosa PAO1, an opportunistic pathogen.";

Nature 406:959-964(2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       5-phosphate (DXP) synthase and DAR LUCLUS CONTROL (DXP) synthase and D
                              This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                         4-phosphate (MEP).

-i- CATALYTIC ACTIVITY: 2-C-methyl-D-erythritol 4-phosphate + NADP(+)

-i- CATALYTIC ACTIVITY: 2-C-methyl-D-erythritol 4-phosphate + NADPH.

-i- ENZYME REGULATION: INHIBITED BY FOSMIDOMYCIN AND 3-(N-ACETYL-N-HYDROXYAMINO)-PROPYLPHOSPHONIC ACID (FR-900098).
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QSKGU6;
QSKGU6;
16-OCT-2001 (Rel. 40, Created)
16-OCT-2001 (Rel. 40, Last sequence update)
15-JUN-2002 (Rel. 41, Last annotation update)
1-deoxy-D-xylulose 5-phosphate reductoisomerase (EC reductoisomerase) (1-deoxyxylulose-5-phosphate reductoisomerase)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A., AND CHARACTERIZATION MEDLINE-20487113; Pubmed-11034300; Altincicek B., Hintz M., Sanderbrand S.,
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                                                                                                                                                                                                                                                          PATHWAY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FUNCTION: Catalyzes the NADP-dependent of 1-deoxy-D-xylulose-5-phosphate (DXP)
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16-OCT-2001 (Rel. 40, Created)
16-OCT-2001 (Rel. 40, Last sequence update)
15-JUN-2002 (Rel. 41, Last annotation update)
1-deoxy-D-xylulose 5-phosphate reductoisomerase (EC 1.1.1.267) (DXP
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or send a
                   STRAIN-MC58 / Serogroup B;

MEDLINE-20175755; PubMed=10710307;

Tettelin H., Saunders N.J., Heidelberg J., Jeffries A.C., Nelson K.E.

Eisen J.A., Ketchum K.A., Hood D.W., Peden J.F., Dodson R.J.,

Nelson W.C., Gwinn M.L., DeBoy R., Peterson J.D., Hickey E.K.,

Nelson W.C., Gwinn M.L., DeBoy R., Peterson J.D., Hickey E.K.,

Haft D.H., Salzberg S.L., White O, Fleischmann R.D., Dougherty B.A.,

Haft D.H., Salzberg S.L., White O, Fleischmann R.D., Dougherty B.A.,

Mason T., Ciecko A., Parksey D.S., Blair E., Cittone H., Clark E.B.,

Cotton M.D., Utterback T.R., Khouri H., Qin H., Vamathevan J.,

Gill J., Scarlato V., Masignani V., Pizza M., Grandi G., Sun L.,

Smith H.O., Fraser C.M., Moxon E.R., Rappuoli R., Venter J.C.;
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Science 287:1809-1815(2000).
Science 287:1809-1815(2000).

of 1-deoxy-D-xylulose-5-phosphate (DXP) to 2-C-methyl-D-erythritol
4-phosphate (MEP) (BP) similarity).

-:- CATALYTIC ACTIVITY: 2-C-methyl-D-erythritol 4-phosphate + NADP(+)

= 1-deoxy-D-xylulose 5-phosphate + NADPH.
                                                                                                                                        DXR_NEIMA STANDARD; PRT; 394 AA.

Q9JX33;
Q6JX33;
Q6JX33;
Q7JX33;
Q7JX
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Pfam; PF02670; DXP_reductoisom; TIGRFAMs; TIGR00243; Dxr; 1.
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reductoisomerase) (1-deoxyxylulose-5-phosphate DXR OR NMA0083.

Neisseria

meningitidis Proteobacteria;

(serogroup beta

subdivision;

Neisseriaceae;

Neisseria

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or send a
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the Euro
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364
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CATALYTIC ACTIVITY: 2-C-methyl-D-erythritol 4-phosphate + 1-deoxy-D-xylulose 5-phosphate + NADPH.
PATHWAY: Nonmevalonate terpenoid biosynthesis pathway; sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              s SWISS-PROT entry is copyright. It is produced through a collaboration ween the Swiss Institute of Bioinformatics and the EMBL outstation. European Bloinformatics Institute. There are no restrictions on its by non-profit institutions as long as its content is in no way ified and this statement is not removed. Usage by and for commercial tites requires a license agreement (See http://www.isb-sib.ch/announce/send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SIMILARITY: BELONGS TO THE DXR FAMILY.
                                                                            FQKPDEERFPALRLARDVMAARGLSGAAFNAAKEIALDHFIAGRIGFLDMAAVVEETLAG
                                                                                                                                           EAVVHPQSIVHAMVGFCDGGLMAHLGPADMRHAIGFALNWPGRGEVPVARIDLAQIASLT
                                                                                                                                                                                     GGPFLTADLNTFDSITPDQAVKHPNWRWGRKISVDSATWMNKGLELIEAHWLFNCPPDKL
                                                                                                                                                                                                                                                  LANKESLVTAGQLLMRTAQENGATILPVDSEHSAVFQALAGEDTA-----CVERVIITAS
DFSDGI--
                           VSTDPLFGKVPDALEEVLAMDHLARRAAEEAAG
                                                         FQKPDFDRFPCLKLAYEAMNAGGAAPCVLNAANEAAVAAFLDGQIKFTDIAKTVAHCLSQ
                                                                                                                         EVVIHPQSVIHSMVRYRDGSVLAQLGNPDMRTPIAYCLGLPERIDSGVGDLDFDALSALT
                                                                                                                                                                                                                    GGPFRDWSLERIRACTVAEAQAHPNWSMGQRISIDSASMFNKALELIETREFFGFEPDRI
                                                                                                                                                                                                                                                                                                                AARLEALLKRDGTATQVLHGAQALVDVASADEVSGVMCAIVGAVGLPSALAAAQKGKTIY
                                                                                                                                                                                                                                                                                                                                             LPALREALA--GTGTEVAGGAQATAEAADR-PADWTMSAIVGAAGLVPGMRALKHGRTLA
                                                                                                                                                                                                                                                                                                                                                                              LTILGSTGSIGESTLDVVSRH---PEKFRVFALAGHKQVEKLAAQCQTFHPEYAVVADAEH
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Pro; IPR003821; DXP_re
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PF02670; DXP_reductoisom;
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          394 AA;
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56; PubMed=10761919;
GDIGGLLAQDARTRAQARAFIG
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41912 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                            tive
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43.0%;
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NADPH (POTENTIAL).
912 MW; B5D361B224806D6B CRC64;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 743.5; DB 1
Pred. No. 2.3e-45;
                                                                                                                                                                                                                                                                                                                                                                                                                                            Mismatches
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391
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RESULT

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STRAIN-cv. Columbia;
Schwender J., Mueller C., Zeidler J., Lichtenthaler H.K.;
Sylmicted (MAY-1999) to the EMBL/GenBank/DDBJ databases.
-: FUNCTION: Catalyzes the NADP-dependent rearrangement and reduction of 1 -deoxy-D-xylulose-5-phosphate (DXP) to 2-C-methyl-D-erythritol 4-phosphate (MEP) (By similarity).
-: CATALYTIC ACTIVITY: 2-C-methyl-D-erythritol 4-phosphate + NADP(+)
-: CATALYTIC ACTIVITY: 2-C-methyl-D-erythritol 4-phosphate + NADP(+)
-: PATHWAY: Nonmevalonate terpenoid biosynthesis pathway: second
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NP_BIND
SEQUENCE
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                                                                                                                                                                                                                       between the Swiss Institute of Bioinformat
the European Bioinformatics Institute. The
use by non-profit institutions as long
modified and this statement is not removed.
entities requires a license agreement (See
or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STRAIN=cv. Columbia;
MEDLINE=98290546; PubMed=9628582;
Sato S., Kaneko T., Kotani H., Nakamura Y.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Arabidopsis thaliana (Mouse-ear cress).

Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheog
Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots;
eurosids II; Brassicales; Brassicaceae; Arabidopsis.
                                                                                                                                                                                                                                                                                                       This SWISS-PROT entry is copyright. It is produced through a obtween the Swiss Institute of Bioinformatics and the EMBL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            "Structural analysis of Arabidopsis thaliana chromosome Sequence features of the regions of 1.456,315 bp covered physically assigned Pl and TAC clones."; DNA Res. 5:41-54(1998).
                                                                                                                                                             EMBL;
                                                                                                                                                                                             EMBL;
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DXR OR AT5G62790 OR MOB2 11.
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15-UN-2002 (Rel. 41, Last annotation update)
1-deoxy-D-xylulose 5-phosphate reductolsomerase, chloroplast precursor
(EC 1.1.1.267) (DXP reductoisomerase) (1-deoxyxylulose-5-phosphate
                                                                                                                TIGRFAMS;
                                                                                                                                           InterPro; IPR003821; DXP_redisomrase
                                                                                                                                                                              EMBL;
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                                                                                                                                                                                                                                                                                                                                                     SUBCELLULAR LOCATION: Chloroplast. SIMILARITY: BELONGS TO THE DXR FAMILY.
                                                                                                                                                           AB009053;
AJ242588;
                                                                                                           PF02670; DXP_reductoisom; AMS; TIGR00243; Dxr; 1.
                                                                                                                                                                                             AF148852; AAF73140.1; -.
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                                                                             peptide.
                                                                                            biosynthesis;
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CAB43344.1;
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 WW.
 NADPH (POTENTIAL).
C06A455AB73ACA7C
                                 REDUCTOISOMERASE
                                                1-DEOXY-D-XYLULOSE
                                                                CHLOROPLAST
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udicots; Rosidae;
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Boronat A.;
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ID DXR_XX
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DT 15-JU
DE 1-deo
DE reduc
GN DXR O
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OX NCBI_
RN [1]
RP SEQUE
RC STRAI
RX MEDIJI
RA Simps
RA Alvar
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Simpson A.J.G., Reinach F.C., Arruda P., Abreu F.A., Acencio M.,

RA Alvarenga R., Alves L.M.C., Araya J.E., Baia G.S., Baptista C.S.,

RA Alvarenga R., Alves L.M.C., Araya J.E., Baia G.S., Baptista C.S.,

RA Barros M.H., Bonaccorsi E.D., Bordin S., Bove J.M., Briones M.R.S.,

RA Coutin M.B., Colombo C., Costa F.F., Costa M.C.R., Carrer H.,

Colauto N.B., Colombo C., Costa F.F., Costa M.C.R., Costa-Neto C.M.,

Ra Coutinho L.L., Cristofani M., Dias-Neto E., Docena C., El-Dorry H.,

Ra Facincani A.P., Ferreira A.J.S., Ferreira V.C.A., Ferro J.A.,

RA Fraga J.S., Franca S.C., Franco M.C., Frohme M., Furlan L.R.,

Ra Fraga J.S., Franca S.C., Franco M.C., Frohme M., Furlan J.P.,

RA HO P.L., HOheisel J.D., Jungueira M.L., Kemper E.L., Kitajina J.P.,

RA HO P.L., HOheisel J.D., Jungueira M.L., Kemper E.L., Kitajina J.P.,

RA Krieger J.E., Kuramae E.E., Laigret F., Lambais M.R., Leite L.C.C.,

Lemos E.G.M., Lemos M.Y.F., Lopes S.A., Lopes C.R., Machado J.A.,

Machado M.A., Madeira A.M.B.N., Madeira H.M.F., Marino C.L.,

RA Margues M.V., Martins E.A.L., Martins E.M.F., Matsukuma A.Y.,

Marques M.V., Martins E.A.L., Martins E.M.F., Matsukuma A.Y.,

Manni A. Jr., Nobrega F.G., Nunes L.R., Oliveira M.A.,

RA Moon D.H., Nagai M.A., Naścimento A.L.T.O., Netto L.E.S.,

RA Nhani A. Jr., Nobrega F.G., Nunes L.R., Oliveira M.A.,

RA Magajio R.B., Roberto P.G., Rodriques V., de Rosa A.J.M.,

Ouaggio R.B., Roberto P.G., Santelli R.V., Sawasaki H.E.,
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16-OCT-2001 (Rel. 40, Created)
16-OCT-2001 (Rel. 40, Last sequence update)
15-JUN-2002 (Rel. 41, Last annotation update)
1-deoxy-D-xylulose 5-phosphate reductoisomerase
reductoisomerase) (1-deoxyxylulose-5-phosphate r
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MEDLINE=20365717; PubMed=10910347;
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Pred. No. 3.
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RESULT 11
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ID DXR_E
DD DXR_B
AC Q8X8Y
DT 15-JU
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DT 15-JU
DT 15-JU
DT 15-JU
DT 1-dec

DXR_ECO57 Q8X8Y1; 15-JUN-2002 15-JUN-2002 15-JUN-2002

(Rel. 41, Created)
(Rel. 41, Last sequence up)
(Rel. 41, Last annotation

update)

STANDARD;

PRT;

398

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1-deoxy-D-xylulose

5-phosphate

reductoisomerase

(EC

update)

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TIGRRAMS; TIGR00243; DXr; 1.
Isoprene biosynthesis; Oxidoreductase; NADP; Complete NP_BIND 1 18
SEQUENCE 396 AA: 42076 ...
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"In the sequence of the plant pathogen Xylella fastidiosa."; Nature 406:151-159(2000).

"In the sequence of the plant pathogen Xylella fastidiosa."; Atcailzes the NADP-dependent rearrangement and reduction of 1-deoxy-D-xylulose-5-phosphate (DXP) to 2-C-methyl-D-erythritol 4-phosphate (MEP) (By similarity).

"Indexatyric Accuracy (By similarity).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        use by non-profit institutions as long modified and this statement is not removed. entitles requires a license agreement (See or send an email to license@isb-sib.ch).
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TLPRY - - EADTLETLLTVDTETRRITHAA
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Pred. No.
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MEDLINE-21156231; PubMed-11258796;

Hayashi T., Makino K., Ohnishi M., Kurokawa K., Ishii K., Yokoya Hayashi T., Makino E., Nakayama K., Murata T., Tanaka M., Tobe T. Iida T., Takami H., Honda T., Sasakawa C., Ogasawara N., Yasunag Kuhara S., Shiba T., Hattori M., Shinagawa H.;

Kuhara S., Shiba T., Hattori M., Shinagawa H.;

*Complete genome sequence of enterohemorrhagic Escherichia coli O157:H7 and genomic comparison with a laboratory strain K-I2.";

DNA Res. 8:11-22(2001).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Nature 409:529
[2]
SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                              EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 This
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                                                                                                                                                                                                                                                                                                                     Isoprene
                                                                                                                                                                                                                                                                                                                               Pfam; PF02670; DXP_reductoisom; 1.
Isoprene biosynthesis; Oxidoreductase; NADP;
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DXR OR Z0184 OR ECS0175.
Escherichia coli 0157:H7.
Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                              EMBL; AP002550; BAB33598.1; -.
InterPro; IPR003821; DXP_redisomrase.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                s SWISS-PROT entry is copyright. It is produced through ween the Swiss Institute of Bioinformatics and the Event business and the Event business and the Event business institute. There are no restrictly non-profit institutions as long as its content
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SIMILARITY:
                                                                                                                                                                               VSILLTGSGGPFRETPLRDLATMTPDQACRHPNWSMGRKISVDSATMMNKGLEYIEARWL
                            ERVIITASGGPFRDWSLERIRACTVAEAQAHPNWSMGQRISIDSASMFNKALELIETREF
                                                         TILLANKESLYTCGRLFMDAVKQSKAQLLPVDSEHNAIFQSLPQPIQHNLGYADLEQNGV
                                                                                      TLALANKESLYTAGQLLMRTAQENGATILPVDSEHSAVFQAL------
                                                                                                                   EASAKLLKTMLQQQGSRTEVLSGQQAACDMAALEDVDQVMAAIVGAAGLLPTLAAIRAGK
                                                                                                                                                 EDCLPALREAL - - AGTGTEVAGGAQAIAE - AADRPADWTMSAIVGAAGLVPGMRALKHGR
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409:529-533(2001).
                                                                                                                                                                                                                                                                                                                                                                                                                      non-profit institutions as long and this statement is not removed. s requires a license agreement (See han email to license@isb-sib.ch).
                                                                                                                                                                                                                                                          Similarity
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RECS0175.
1,0157:H7
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Pred.
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No. 1.3e-44;
                                                                                                                                                                                                                                                                                                                     (POTENTIAL)
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                                   MEDLINE-93077430; PubMed-1447125; Yammanaka K., Ogura T., Niki H., Hiraga S.; "Identification and characterization of the of the mukb null mutant of Escherichia coli. J. Bacteriol. 174:7517-7526(1992).
                                                                                                                                              Lashkari D.,
Davis R.W.;
                                                                                                                                                                                                                                       STRAIN-K12 / W3110;
Takemoto K., Mori H., Murayama N., Kataoka K., Yano M., Yamamoto Y., Inokuchi H., Miki T., Hatada E., Fukuda R., Yamamoto Y., Makino K., Nakata A., Yura T., Sampei G., Mizuno T., Makino K., Nakata A., Yura T., Sampei G., Mi Systematic sequencing of the Escherichia coli genome:
"Systematic sequencing of the Escherichia coli genome:
"0. - 6.0 min (189,987 - 281,416bp) region.";
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STRAIN=K12 / MG16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Takahashi S., Kuzuyama T., Watanabe H., Seto H.; "A 1-deoxy-D-xylulose 5-phosphate reductolsomerase of formation of 2-C-methyl-D-crythritol 4-phosphate in nonmevalonate pathway for terpenoid biosynthesis.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        reductoisomerase) (1-deoxyxylulose-5-phosphate DXR OR B0173.
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01-NOV-1997 (Rel. 35, Last sequence update)
15-JUN-2002 (Rel. 41, Last annotation update)
15-JUN-2002 (Rel. 41, Last annotation update)
1-APOXV-D-XYlulose 5-phosphate reductoisomerase (EC
IDENTIFICATION.
MEDLINE=96032851;
                                                                                         SEQUENCE OF 1-49 I
MEDLINE=93077430;
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S., Duncan M.,
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E., Fukuda R., Ichihara
Sampei G., Mizobuchi K.,
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"Characterization of 1-deoxy-D-xylulose 5-phosphate reductoisomerase, an enzyme involved in isopentenyl diphosphate biosynthesis, and identification of its catalytic amino acid residues.";

J. Biol. Chem. 275:19928-19932(2000).

-I- FUNCTION: Catalyzes the NADP-dependent rearrangement and reduction of 1-deoxy-D-xylulose-5-phosphate (DXP) to 2-C-methyl-D-crythritol
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     the European Bioinformatics Institute. The use by non-profit institutions as long modified and this statement is not removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TIGRFAMS; TIGRO0243; Dxr; Isoprene biosynthesis; Oxi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EMBL; D13334; -; NOT_ANNOTATED_CDS
EcoGene; EG12715; dxr.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Eisenreich W., Bacher A., Zenk M.H., Arigoni D.; "Biosynthesis of terpenoids: 1-deoxy-D-xylulose-5-phosphate reductoisomerase from Escherichia coli is a class B dehydro
                                                                                                                                                                                                                                                                       SEQUENCE
                                                                                                                                                                                                                                                                                              CONFLICT
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59
                                         61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SIMILARITY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            4-phosphate (MEP).

CATALYTIC ACTIVITY: 2-C-methyl-D-erythritol 4-phosphate = 1-deoxy-D-xylulose 5-phosphate + NADPH.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SUBUNIT: HOMOTETRAMER.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PATHWAY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ENZYME REGULATION: INHIBITED BY FOSMIDOMYCIN
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EASAKLLKTMLQQQGSRTEVLSGQQAACDMAALEDVDQVMAAIVGAAGLLPTLAAIRAGK
                                       EDCLPALREAL -- AGTGTEVAGGAQAIAE-AADRPADWTMSAIVGAAGLVPGMRALKHGR
                                                                                                                                MRSLSIFGATGSIGESTFDLVMRKGGPEAFRTVALTGGRNIRRLAEMARALKAELAVTAH
                                                                                      MKQLTILGSTGSIGCSTLDVV--RHNPEHFRVVALVAGKNVTRMVEQCLEFSPRYAVMDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ABUUU126; AAC73284.1; -. D83536; BAA77848.1; -. U70214; AAB08602.1; -. D13334
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AB013300; BAA32426.1; -. AE000126; AAC73284.1; -.
                                                                                                                                                                                                      Similarity
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H->Q: INCREASE IN KM.
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72; Mismatches
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Isoprene

biosynthesis;

Oxidoreductase; NADP; Complete

SEQUENCE

398 AA;

43115 MW;

C9B1FC9E0166D057 CRC64, (POTENTIAL

NADPH

Pfam; PF02670; DXP_reductoisom; TIGRFAMS; TIGR00243; Dxr; 1.

EMBL; AJ414146; CAC89890.1;

IPR003821;

DXP_redisomrase

InterPro;

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RESULT 13
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ID XXR_YEAPS
ID XXR_YEAPS
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DT 15-J
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Q8ZH62;
15-JUN-2002
15-JUN-2002
                                                                                                                                                                                                                                                                                   use by non-profit institutions as long modified and this statement is not removed entities requires a license agreement (See
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Parkhill J., Wren B.W., Thomson N.R., Titball R.W., Holden M.T.G., Prentice M.B., Sebaihia M., James K.D., Churcher C., Mungall K.L., Basham D., Bentley S.D., Brooks K., Cerdeno-Tarraya A.M., Chillingworth T., Cronin A., Davies R.M., Davis P., Dougan G., Feltwell T., Hamlin N., Holroyd S., Jagels K., Karlyshev A.V., Leather S., Moule S., Oyston P.C.F., Quail M., Rutherford K., Simmonds M., Skelton J., Stevens K., Whitehead S., Barrell B.G.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      "Genome sequence of Yersinia pestis, the causative Nature 413:523-527(2001).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STRAIN=CO-92 / Biovar Orientalis; MEDLINE=21470413; PubMed=11586360;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Yersinia pestis.
Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                         or send an email to license@isb-sib.ch]
                                                                                                                                                                                                                                                                                                                                                                                                                       between
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE FROM N.A.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FUNCTION: Catalyzes the NADP-dependent rearrangement and reduction of 1-deoxy-D-xyluLose-5-phosphate (DXP) to 2-C-methyl-D-erythritol 4-phosphate (MEP) (By similarity).

CATALYTIC ACTIVITY: 2-C-methyl-D-erythritol 4-phosphate + NADP(+)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SIMILARITY: BELONGS TO THE DXR FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           = 1-deoxy-D-xylulose 5-phosphate + NADPH. · PATHWAY: Nonmevalonate terpenoid biosynthesis
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FGFEPDRIEAVVHPQSIVHAMVGFCDGGLMAHLGPADMRHAIGFALNWPGRGEVPVARID
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(Rel. 41, Last annotation update)
ylulose 5-phosphate reductoisomerase
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                                                                                                                                                                                                                                                                                                                 Usage
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STRAIN-Rd / KW20 / ATCC 51907;

Fleischmann R.D. Adams M.D. White O., Clayton R.A., Kirkness E.F.,

Kerlavage A.R. Bull C.J. Tomb J.-F., Dougherty B.A., Merrick J.M.,

McKenney K., Sutton G., Fitzhugh W., Fields C.A., Gocayne J.D.,

McKenney K., Shirley R., Liu L.-I., Glodek A., Kelley J.M.,

Weidman J.F., Phillips C.A., Spriggs T., Hedblom E., Cotton M.D.,

Utterback T.R., Hanna M.C., Nguyen D.T., Saudek D.M., Brandon R.C.,

Fine L.D., Fritchman J.L., Fuhrmann J.L., Geoghagen N.S.M.,

Gnehm C.L., McDonald L.A., Small K.V., Fraser C.M., Smith H.O.,
                                                                                                                                                                                                                                   Rd.";
Science
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               01-NOV-1995 (Rel. 32, Created)
01-NOV-1995 (Rel. 32, Last sequence update)
15-JUN-2002 (Rel. 41, Last annotation update)
1-deoxy-D-xylulose 5-phosphate reductoisomerase
reductoisomerase) (1-deoxyxylulose-5-phosphate r
                                                                                                                                                                                                                                                                                       "Whole-genome random
                                                                                                                                                                                                                                                                                                                       Venter
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                                                                                                 FUNCTION: Catalyzes the NADP-dependent reary
of 1-deoxy-D-xylulose-5-phosphate (DXP) to 2
4-phosphate (MEP) (By similarity)
CATALYTIC ACTIVITY: 2-C-methyl-D-erythritol
= 1-deoxy-D-xylulose 5-phosphate + NADPH.
                           SIMILARITY: BELONGS
                                                                           PATHWAY: Nonmevalonate
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nilarity 40.7%;
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Pred. No. 4.6e-44;
9; Mismatches 147
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           subdivision;
                           FAMILY
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                                                                   biosynthesis
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) to 2-C-methyl
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16-OCT-2001 (Rel. 40, Last sequence update)
15-OCT-2001 (Rel. 41, Last annotation update)
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ID DXR_PASMU STANDARD; PRT; 405 AA.

AC P57985;
DT 16-OCT-2001 (Rel. 40, Created)
DT 16-OCT-2001 (Rel. 41, Last sequence update)
DT 15-JUN-2002 (Rel. 41, Last annotation update)
DT 1-deoxy-D-xylulose 5-phosphate reductoisomerase (EC 1.1.267) (DXP 1-deoxy-D-xylulose 5-phosphate reductoisomerase).

BE reductoisomerase) (1-deoxyxylulose-5-phosphate reductoisomerase).

CN PASTEURELLA multocida.
CN PASTEURELLA PROCEOBACTERIA; gamma subdivision; Pasteurellaceae;
CN PASTEURELLA PROCEOBACTERIA; gamma subdivision; Pasteur
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Best Local Similarity 39.3
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Isoprene biosynthesis; Oxidoreductase; NADP; Complete proteome NP_BIND 13 20 NADPH (POTENTIAL). SEQUENCE 405 AA; 44207 MW; 1CFF7B44847F8BF7 CRC64;
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-!- CATALYTIC ACTIVITY: 2-C-methyl-D-erythritol 4-phosphate + NADP(+)
-!- PATHWAY: Nonmevalonate terpenoid biosynthesis pathway; second
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Q8XS09
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Q8R622
Q96693
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Q947C3
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Q9SP64
Q9FTN0
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Q9exil klebsiella
Q91ze6 mus musculu
Q8vie5 mus musculu
Q9a4v4 caulobacter
Q8xs09 ralstonia s
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OSp64 artemisia a
O9ftno oryza sativ
O9fx27 zea mays (m
O947c3 lycopersico
O8w250 oryza sativ
O9m4w4 catharanthu
O8ra28 thermoanaer
                                                                                            Q9ajd7 kitasatospo
Q8r622 fusobacteri
O96693 plasmodium
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klebsiella
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ID QBUCR6

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CC Rhiz
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Q8UC86;
01-JUN-2002
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MEDLINE-21608551; PubMed=11743194;

MEDLINE-21608551; PubMed=11743194;

Goodner B., Hinkle G., Gattung S., Miller N., Blanchard M.,

Goodner B., Hinkle G., Cao Y., Askenazi M., Halling C., Mullin L.,

Plouniel K., Gordon J., Vaudin M., Lartchouk O., Epp A., Liu F.,

Wollam C., Allinger M., Doughty D., Scott C., Lappas C., Markelz B.,

Flanagan C., Crowell C., Gurson J., Lomo C., Sear C., Strub G.,

Cielo C., Slater S.;

Cielo C., Slater S.;
                                                                                                                                                                                                                                          Chapman P., Clendenning J., Deatherage G., Gillet W., Grant C., Kutyavin T., Levy R., Li M.-J., McClelland E., Palmieri A., Raymond C., Rouse G., Saenphimmachak C., Wu Z., Romero P., Gordo Zhang S., Yoo H., Tao Y., Biddle P., Jung M., Krespan W., Perry Gordon Kamm B., Liao L., Kim S., Hendrick C., Zhao Z.-Y., Dolan Chumley F., Tingey S.V., Tomb J.-F., Gordon M.P., Olson M.V., Nester E.W.;
                                                                                                                                                                                                           "The genome of the natural genetic engineer Agrobacterium tumefaciens C58.";
                                                                                                                                                                                                                                                                                                                                                                             MEDLINE=21608550; PubMed=11743193; Wood D.E., Kitajima J.P., Wood D.W., Setubal J.C., Kaul R., Monks D.E., Kitajima J.P., Okura V.K., Zhou Y., Chen L., Wood G.E., Almeida N.F. Jr., Woo Chen Y., Paulsen I.T., Eisen J.A., Karp P.D., Bovee D. Sr.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Agrobacterium tumefaciens (strain C58 / ATCC 33970).
Bacteria; Proteobacteria; alpha subdivision; Rhizobiaceae group;
Rhizobiaceae; Rhizobium.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        01-JUN-2002 (TrEMBLrel. 21, Last sequence update)
01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
1-deoxy-D-xylulose 5-phosphate reductoisomerase.
DXR OR ATUZ612 OR AGR_C_4736.
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Genome sequence of the plant pathogen and biotechnology agent
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Q93NI9
Q93NI9
Q93HI9
5 Q92TT6
6 Q92TT6
6 Q92IW5
6 Q9A4D6
6 Q912I1
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Osors streptomyce
Osors methylobaci
Osossos caulobacter
Osyd51 brucella me
Osl431 streptomyce
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Osl431 streptomyce
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Q65553 bovine herp
Q9adf2 streptomyce
Q9ac90 actinomadur
Q914x2 streptomyce
Q50442 mycobacteri
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Q92t46 rhizobium m
Q92iw5 streptomyce
Q9a4d6 caulobacter
Q912i1 pseudomonas
Q05170 streptomyce
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Q9zni6 pseudomonas
Q93hi9 streptomyce
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Gordon

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01-MAY-2000 (TrEMBLrel. 13,
01-MAR-2001 (TrEMBLrel. 16,
01-JUN-2002 (TrEMBLrel. 21,
                                                                                                                                                                                                                                                                            STRAIN=CV. YUGOSLAVIA; TISSUE=ROOT;
Wobbe K.K., Souret F.F., Shore K.A., Weathers P.J.;
"Artemisia annua 1-deoxy-D-xylulose-5-phosphate red
                                                                                                                                                                                                                                                                                                                                                                                                                                              Artemisia annua (Sweet wormwood).
Bukaryota; Viridiplantae; Streptophyta; Embryophyta; Trachec
Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots;
Asteridae; euasterids II; Asterales; Asteraceae; Asteroideae
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                                                                                                                                              TIGRFAMS; TIGR00243;
                                                                                                                                                                                                                  EMBL;
                                                                                                                                                                                                                                     Submitted (AUG-2000)
                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
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                                                                                                                                                               tted (AUG-2000) to the EMBL/Geni
AF182287; AAD56391.2; -.
Pro; IPR003821; byp_redisomrase
PF02670; DXP_reductoisom; 1.
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    Conservative
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42303 MW;
                                                                                                50740 MW;
                                                                                                                                            Dxr;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              el. 13, Created)
el. 16, Last sequence updata
el. 21, Last annotation updata
phosphate reductoisomerase
                          38.0%;
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Pred. No. 1.3e-54;
64; Mismatches 126
Score 754; DB 10;
Pred. No. 1.7e-39;
77; Mismatches 136
                                                                                                                                                                                                                                     EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRT;
                                                                                              D52023C09D475675
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annotation update)
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                                                                                                CRC64;
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                                                                                                                        Query Match
Best Local
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Ehrhartoideae; Oryzeae; Oryza.
RCBI_TaxID=4530;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRAIN-CV. NIPPONBARE;
Sasaki T., Matsumoto T., Yamamoto K.;
"Oryza sativa nipponbare(GA3) genomic
clone:P0005A05.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       01-MAR-2001 (TrEMBLrel. 16, Created)
01-MAR-2001 (TrEMBLrel. 16, Last sequence update)
01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
1-deoxy-d-xylulose-5-phosphate reductoisomerase.
p0005A05.19 OR p0482C06.2.
                                                                                                                                                                                                                                             Pfam; PF02670; DXP_reductoisom; TIGRFAMs; TIGR00243; Dxr; 1.
                                                                                                                                                                                                                                                                                                                                                                                            "Oryza sativa nipponbare(GA3) clone: P0482C06.";
                                                                                                                                                                                                                                                                                                                                                                                                                                             STRAIN=CV. NIPPONBARE; Sasaki T., Matsumoto T.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Submitted
                                                                                                                                                                                               SEQUENCE
                                                                                                                                                                                                                                                                                              InterPro;
                                                                                                                                                                                                                                                                                                                          EMBL:
                                                                                                                                                                                                                                                                                                                                              EMBL;
                                                                                                                                                                                                                                                                                                                                                                     Submitted (AUG-2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
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  KPISIVGSTGSIGTQTLDIVAE--NPDKFRVVALAAGSNVTLLADQVKTFKPKLVAVRNE
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AP002863; BAB16915.1; -
AP002845; BAB78066.1; -
Pro: IPR003821; DXP_redisomrase
                                                                                                                     Similarity
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(GA3) genomic DNA, chromosome
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                                                                                              Score 747; DB 10;
Pred. No. 4.7e-39;
4; Mismatches 138;
                                                                                                                                                                                               9933D9D8C3D1FC49 CRC64;
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                                                                                                                                                                                                                                                                             Query Match
Best Local S
Matches 166
                                                                                                                                                                                                                                                                                                                                                                               Hans J., Hause B., Strack D., Walter M.H.;

"Regulation of the non-mevalonate methylerythritol phosphate
pathway by mycorrhizal fungi.";

Submitted (AUG-2000) to the EMBL/GenBank/DDBJ databases.
EMBL; AJ297566; CAC03581.1;

InterPro; IPR003821; DxP_redisomrase.

Pfam; PF02670; DxP_reductoisom; 1.

TIGRFAMS; TIGR00243; Dxr; 1.

ô9FXZ7;
01-MAR-2001 (TrEMBLrel. 16,
01-JUN-2001 (TrEMBLrel. 21,
01-JUN-2002 (TEMBLrel. 21,
Putative 1-deoxy-D-xylulose

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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
STRAIN-DWARF-1; TISSUE-ROOT;
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                                                                                                                                                                                                                                                                                                                                                  SEQUENCE
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                                FRDWSLERIRACTVAEAQAHPNWSMGQRISIDSASMFNKALELIETREFFGFEPDRIEAV
                                                                 SLVDELKEALADCEEKPEIIPGEQGVIEVARHPDAVTVVTGIVGCAGLKPTVAAIEAGKD
                                                                                                                                                         RSLSIFGATGSIGESTFDLVMRKGGPEAFRTVALTGGRNIRRLAEMARALKAELAVTAHE
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                                                                                                                                                                                                                                                                                 166;
                                                                                                                                                                                                                                                                          Similarity 41.4
66; Conservative
                                                                                                                                                                                                                                                                                                                                                472 AA;
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                                                                                                                                                                                                                                                                                              37.68;
                                                                                                                                                                                                                                                                                                                                                  51285 MW;
                                                                                                                                                                                                                                                                             73;
                                                                                                                                                                                                                                                                           Score 746; DB
Pred. No. 5.5e
73; Mismatches
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Last annotation update)
5-phosphate reductoisomerase
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5.5e-39;
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Q947C3;
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EMBL; AF331705; AAK96083.2; ...
InterPro; IPR003821; DXP_redisomrase.
Pfam; PF02670; DXP_reductoisom; 1.
TIGRFAMS; TIGR00243; DXr; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Lycopersicon esculentum (Tomato).

Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta;

Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots;

Asteridae; euasterids I; Solanales; Solanaceae; Solanum.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          01-DEC-2001 (TrEMBLrel. 19, Created)
01-DEC-2001 (TrEMBLrel. 19, Last sequence update)
01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MEDLINE=21425086; PubMed=11532167;
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437
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                                                                                                                                                                                                                                                                        FQKPDEERFPALRLARDVMAARGLSGAAFNAAKEIALDHFIAGRIGFLDMAAVVEETLAG
                                                                                                                                                                                                                                                                                                                                                                                           LALANKESLYTAGQLLMRTAQENGATILPYDSEHSAYFQALAGEDTACYERVIITASGGP
                                                                                                                                                                                                                                                                                                                                                                                                                                                            SLVEELKDALADMEDKPEIIPGEQGVIEVARHPDAVTVVTGIVGCAGLKPTVAAIEAGKD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DCLPALREALAG--TGTEVAGGAQAIAEAADRP-ADWTMSAIVGAAGLVPGMRALKHGRT
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                                                                                      FKAPDNVKYPSMDLAYSAGRAGGTMTGVLSAANEKAVELFISERISYLDIFKIVELTCAK 436
                                                                                                                                                                               IHPOSIIHSMVETQDSSVLAQLGWPDMRLPILYTLSWPDRVYCSEITWPRLDLCKLGSLT
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                                           VSTDPLFGKVPDALEEVLAMDHLARRAA---
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PSLEEIIHYDLWARDYAASLEPSSGL
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Pred. No. 6.4e-39;
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                                           -EEAAGL
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Best Local :
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O8W250;

O1-MAR-2002 (TTEMBLICEL 2

O1-MAR-2002 (TTEMBLICEL 2

O1-JUN-2002 (TTEMBLICEL 2

O1-JUN-2002 (TTEMBLICEL 2

1-deoxy-D-xylulose|5-phos
                                                                                Q9M4W4;
01-OCT-2000 (
01-OCT-2000 (
01-JUN-2002 (
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Pfam; PF02670; DXP_reductoisom; 1.

Transit peptide; Isomerase; Oxidoreductase.

TRANSIT 1 49 POTENTIAL.

SEQUENCE 473 AA; 51497 MW; 618C4A675283
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Eukaryota; Viridiplantae; Streptophyta; Embryophyta;
Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poa
Ehrhartoideae; Oryżeae; Oryza.
        DXR.
Catharanthus
                                                     01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-OUN-2002 (TrEMBLrel. 21, Last annotation update)
1-deoxy-D-xylulose-5-phosphate reductoisomerase.
                                                                                                                                                                                             Q9M4W4
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                biosynthesis.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Carretero-Paulet L., Boronat A., Campos N.;
"I-deoxy-D-xylulose 5-phosphate reductoisomerase (Effect committed step of the mevalonate-independent
                                                                                                                                                                                                                                                                                                                                   435
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STRAIN-MB4T / JCM11007;

K MEDLINE-21992816; PubMed-11997336;
K MEDLINE-21992816; PubMed-11992816;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
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Bacteria; Firmicutes; Bacillus/Clostridium group; (
Thermoanaerobacteriales; Thermoanaerobacteriaceae;
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"Cloning and expression of cDNAs encoding

pathway in Catharanthus roseus.",

Biochim. Biophys. Acta 1517:159-163(2000).

EMBL; Ar250235; AAF65154.1;

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Minimum A., Chenieux J.-C.
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                                                                                                                                                                                                                  Hamano Y., Dairi T., Yamamoto M., Kuzuyama T., Itoh N., Seto "Growth phase dependent expression of the mevalonate pathway terpenoid antiblotic-producing Streptomyces strain."; Submitted (SEP-2000) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                      Q9AJD7;
01-JUN-2001 (TrEMBLrel. 17, Created)
01-JUN-2001 (TrEMBLrel. 17, Last sequence update)
01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
                                                                                                                                                                        InterPro; IPR003821; DXP_redisomrase
Pfam; PF02670; DXP_reductoisom; 1.
TIGRFAMs; TIGR00243; Dxr; 1.
                                                                                                                                                                                                                                                                                                                                                 Kitasatospora griseola (Streptomyces griseolosporeus). Bacteria; Firmicutes; Actinobacteria; Actinobacteridae;
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                                                                                                                                              SEQUENCE
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                                                                                                                                                          Isomerase.
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 PALREALA-GTGTEVAG----
                         ILGSTGSIGTQAIDVVLR--NPGRFKVVALSAAGGAVELLAEQAVALGVHTVAVAD----
                                                      IFGATGSIGESTFDLYMRKGGPEAFRTVALT-GGRNIRRLAEMARALKAELAVTAHEDCL
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                                                                                                                                           386 AA;
                                                                                     Conservative
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40.4%; Pred. No. 3e-35;
tive 66; Mismatches 1
                                                                                    50;
                                                                                    Score 665.5; DB 2;
Pred. No. 4.6e-34;
0; Mismatches 155;
 -GAQAIAEAADRPADWTMSAIVGAAGLVPGMRALKH 115
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                                                                                                                                           FA7E2E9CF9EBB088 CRC64;
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Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Kapatral V., Anderson I., Ivanova N., Reznik G., Los T., Lykidis / Bhattacharyya A., Bartman A., Gardner W., Grechkin G., Zhu L., Vasieva O., Chu L., Kogan Y., Chaga O., Goltsman E., Bernal A., Larsen N., D'Souza M., Walnas T., Pusch G., Haselkorn R., Fonstein M., Kyrpides N., Overbeek R.; "Genome sequence and analysis of the oral bacterium Fusobacterium nucleatum strain ATCC 2586.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
STRAIN=ATCC 25586;
MEDLINE=21886394; PubMed=11889109;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           J. Bacteriol. 184:2005-2018(2002).
EMBL; AE010637; AAL95520.1; -.
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01-JUN-2002
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)1-JUN-2002 (TrEMBLrel. 21, Last annotation update)
|-deoxy-D-xylulose 5-phosphate reductoisomerase (EC
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  VVHPQSIVHAMVGFCDGGLMAHLGPADMRHAIGFALNWPGRG-EVPVARIDLAQIASLTF
                                                        TFRGKDLAYLENVTVEQALKHPNWSWGKKITIDSSTLVNKGLEVIEAHELFNVDYDDIEV
                                                                                                       PFRDWSLERIRACTVAEAQAHPNWSMGQRISIDSASMFNKALELIETREFFGFEPDRIEA 237
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                                                                                                                                                                      EQDAIYLKKE--YSFIKEVYFGENGLAELSKNSDYDIILTAVSGAIGIDATVEAIKRGKR 119
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8; Mismatches
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      096693;
01-MAY-1999 (TrEMBLrel. 10, Last sequence upuacu,
01-MAY-1999 (TrEMBLrel. 21, Last annotation updat
01-JUN-2002 (TrEMBLrel. 21, Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Altincicek B., Sanderbrand S., Wiesner J., Jomaa H.; "dxr as a potential target for antimalarial drugs."; Submitted (DEC-1998) to the EMBL/GenBank/DDBJ databases. EMBL, AF111813; AAD03/739.1; -
 Q9EXI1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TIGRFAMS; TIGRO0243;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Pfam; PF02670;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Plasmodium falciparum
Eukaryota; Alveolata;
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                                                                                          IKYFDISSIISQVLESFNSQKVSENSEDLMKQILQIHSWAKDKATD
                                                                                                                                                                      KPLDLAQVSTLTFHKPSLEHFPCIKLAYQA---
                                                                                                                                                                                                          ARIDLAQIASLTFQKPDEERFPALRLARDVMAARGLSG----AAFNAAKEIALDHFIAGR 339
                                                                                                                                                                                                                                             THFLFDVDYNDIEVIVHKECIIHSCVEFIDKSVISQMYYPDMQIPILYSLTWPDRIKTNL
                                                                                                                                                                                                                                                                                TREFFGFEPDRIEAVVHPQSIVHAMVGFCDGGLMAHLGPADMRHAIGFALNWPGRGEVPV 283
                                                                                                                                                                                                                                                                                                                                                                                                                                      TLALANKESLYTAGQLLMRTAQ-ENGATILPVDSEHSAVFQALAGE---DTAC----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SVYEELKELVKNIKDYKPIILCGDEGMKEICSSNSIDKIVIGIDSFQGLYSTMYAIMNNK 198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DCLPALREALAGTGTE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SLSIFGATGSIGESTFDLVMRKGGPE-AFRTVALTGGRNIRRLAEMARALKAELAVTAHE 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QVLTLNTD----
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                                                                                                                                                                                                                                                                                                                          INNINKIFLCSSGGPFQNLTMDELKNVTSENALKHPKWKMGKKITIDSATMMNKGLEVIE
                                                                                                                                                                                                                                                                                                                                                           ---VERVIITASGGPFRDWSLERIRACTVAEAQAHPNWSMGQRISIDSASMFNKALELIE 223
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QKPDEERFPALRLARDVMAARGLSGAAFNAAKEIALDHFIAGRIGFLDMAAVVEETLAG-
                                                                                                                                                                                                                                                                                                                                                                                                IVALANKESIVSAGFFLKKLLNIHKNAKIIPVDSEHSAIFQCLDNNKVLKTKCLQDNFSK 258
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----VSTDPLFGKVPDALEEVLAMDHLARRAAEE 385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EEADRKVLKGIDLAYRAGRIGDIMPIVFNASNEIAVELFMKKQIKFLDIYRIIEEAMNSH 359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            al Similarity
124; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     488
PRELIMINARY;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            --VAGGAQAIAE-AADRPADWTMSAIVGAAGLVPGMRALKHGR 117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            88;
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Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 519.5; DB 5
 PRT;
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115
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                                                                                                                                                                  -GIKGNFYPTVLNASNEIANNLFLNNK
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Q91ZE6
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Best Local :
                                                 PROSITE;
PROSITE;
               PROSITE;
SEQUENCE
                                                                                        Pfam; PF00169; PH; 1.
Pfam; PF00435; spectrin; 17.
PROSITE; PS00019; ACTININ_1;
                                                                                                                                                                                                                                                                                                Parkinson N.J., Olsson C.L., Hallows J.L., N
Keogh B.P., Noben-Trauth K., Kujawa S.G., Te
"Mutant beta-spectrin 4 causes auditory and
quivering mice.";
                                                                                                                                                                                                                                                                                                                                                                                                                                Mus musculus (Mouse).
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus
NCBI_TaxID=10090;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q91ZE6;
Q91ZE6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Lai Y.C., Chang H.Y., Peng H.L.;
"Identification of Klebsiella pneumoniae CG43
expressed in vivo.";
Submitted (DEC-2000) to the EMBL/GenBank/DDBJ
EMBL; AJ292312; CAC19426.1;
InterPro; IPR003821; DXP_redisomrase.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  09EXII.
01-MAR-2001 (TrEMBLrel. 16, Creat
01-MAR-2001 (TrEMBLrel. 15, Last
01-JUN-2002 (TrEMBLrel. 21, Last
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              01-DEC-2001 (TrEMBLrel. 19, 01-DEC-2001 (TrEMBLrel. 19, 01-JUN-2002 (TrEMBLrel. 21,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Klebsiella pneumoniae.
Bacteria; Proteobacteria;
                                                                                                                                               InterPro; IPR002017
Pfam; PF00307; CH;
                                                                                                                                                                                    InterPro; IPR001589;
InterPro; IPR001715;
InterPro; IPR001849;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STRAIN=CG43
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                                                                                                                                                                                                                                             MGD; MGI:1890574;
                                                                                                                                                                                                                                                                 EMBL;
                                                                                                                                                                                                                                                                                    Nat. Genet.
                                                                                                                                                                                                                                                                                                                                                                             MEDLINE=21419653; PubMed=11528393;
                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SPNB4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Beta4-spectrin.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MKQLTVLGSTGSIGCSTLDVV--RHNPGRFSVAALVAGKNVDRMVEQCLEFTPRYAVMDD 58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AQSAERLRTRLHEHGSRTEVLSGQQAAAEVAALDEVDQVMAAIVGAAGLVPTLAAIR 115
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                                                                                                                                                                                                                                                               Genet. 29:61-65(2001).
AY032655; AAK38731.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      . Similarity
49; Conserv
                                 PS00019;
PS00020;
PS50021;
PS50003;
                                                                                                                                                                    IPR002017;
                                                                                                                                                                                                          IPR001589;
IPR001715;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               115
115 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
               ; ACTININ_2;
; CH; 2.
; PH_DOMAIN;
AA; 288132 M
                                                                                                                                                                                                                                           Spnb4.
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12174 MW;
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                                                                                                                                                                    Spectrin.
                                                                                                                                                                                      Calponin-like. PH.
                                                                                                                                                                                                                           Actbind_actnin.
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MW,
1-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Created)
Last sequence update)
Last annotation update)
                                                                      UNKNOWN_1.
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Pred. No. 0.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              pneumoniae CG43 genes
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
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                 39FBC7E410289D45 CRC64;
                                                                                                                                                                                                                                                                                                                                                         J.L., McKee-Johnson
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        .0002;
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Best Local
                                                                     SMART; SMUUZZZ,
SMARR; SMOUSS, SPEC; 16.
PROSITE; PS00019; ACTININ_1; UNKNOWN_1.
PROSITE; PS00020; ACTININ_2; UNKNOWN_1.
PROSITE; PS50021; CH; 2.
PROSITE; PS50003; PH_DOMAIN; 1.
PROSITE; PS50003; PH_DOMAIN; 1.
                                                                                                                                                                                                                SMART; SM00033;
SMART; SM00233;
SMART; SM00150;
                                                                                                                                                                                                                                                                                                                                                                                                                                                    at axon initial segments and nodes of Ranvier."; J. Cell Biol. 156:337-348(2002). EMBL; AB055618; BAB83243.1; -.
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01-MAR-2002 (TrEMBLrel.
01-JUN-2002 (TrEMBLrel.
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hes 103;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                42 RRLAEMARALKAELAVTAHEDCLPALREALAGTGTEVAGGAQAIA-----
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RRLARQHRALTGE--VEAHRGPVGGLRRQLATLGGASGAGPLVVALQVRVVEAEQLFAEV
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    103;
                                                                                                                                                                                                                                                                                        PF00435;
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                             Similarity
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IPR001715;
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  Conservative
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                                                                                                                                                                                                                                                                                   spectrin; 17.
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Rodentia;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     20,
    43;
Score 136.5; D
Pred. No. 6.2;
43; Mismatches
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Last sequence update)
Last annotation updat
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                                               DB 11;
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    138;
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Q1-JUN-2001 (TrEMBLrel. 17,
Q1-JUN-2001 (TrEMBLrel. 17,
Q1-MAR-2002 (TrEMBLrel. 20,
Metal ion efflux outer memb)
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MEDLINE-21173698; PubMed-11259647;
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Pfam; PF02321; OEP;
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                                                                                                                                                                       SIGESTFDLVMR--KGGPEAFRTVALTGGRNIRRLAEMARALKAELAVTAHEDCLPALRE
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ALA---LEAKARVAVAQEAAERARDLARVAAALVEAGREPPLRALR-ART
                                                  ALAGTGTEVAGGAQAIAEAADRPADWT-MSAIVGAAGLVPGMRALKHGRTLALANKESLV 128
                                                                                                              SNAETTFSLGQRLELGGKR--RTRVATAQAEVETAAVRAAIARADLTQEV-----KTRY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ETLAGVSTDPLFGKVPDALEEVLAMDHLARRAA-EEAAGLRQQ
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                                                                                                                                                                                                                                                                                                                                            43076 MW;
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Last annotation updat
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Pred. No. 0.99;
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Database
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Maximum DB seq length: 2000000000
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Total number of hits satisfying chosen parameters:
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Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GenCore version 5.1.4_p5_4578 Copyright (c) 1993 - 2003 Compugen Ltd.
                                                                                                                                                                                                                                                                                     /cgn2_6/ptodata/2/pubpaa/US08_NEW_PUB.pep:*
/cgn2_6/ptodata/2/pubpaa/PCT_NEW_PUB.pep:*
/cqn2_6/ptodata/2/pubpaa/US06_NEW_PUB.pep:*
/cgn2_6/ptodata/2/pubpaa/US09_PUBCOMB.pep:*
/cgn2_6/ptodata/2/pubpaa/US10_NEW_PUB.pep:*
/cgn2_6/ptodata/2/pubpaa/US10_NEW_PUB.pep:*
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Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

	19	18	17	16	15	14	13	12	11	10	φ	8	7	6	s	4	ω	2	1	Result No.
	103.5	103.5	103.5	103.5	106.5	106.5	113.5	115	115	601	628	736	737.5	737.5	741.5	741.5	778	778	778	Score
	5.2	5.2	5.2	5.2	5.4	5.4	5.7	5.8	5.8	30.3	31.7	37.1	37.2	37.2	37.4	37.4	39.2	39.2	39.2	Query Match L
	11877	11877	4613	4613	1616	609	7257	5215	5215	392	436	477	477	477	477	477	394	394	394	Length
	10	9	10	9	9	9	9	10	9	9	9	9	10	9	10	10	10	10	9	DB
•	US-09-861-289-6	US-09-860-846-6	US-09-861-289-31	US-09-860-846-31	US-09-712-363-262	US-09-308-207-67	US-10-014-717-5	US-09-861-289-2	US-09-860-846-2	US-09-738-626-5709	US-09-712-363-258	US-10-047-412A-10	US-09-923-556-2	US-10-047-412A-29	US-09-987-025-2	US-09-923-556-6	US-09-934-868-64	US-09-934-903-4	US-09-941-947A-8	ID
	Sequence 6, Appli		Sequence 31, Appl	Sequence 31, Appl	Sequence 262, App	Sequence 67, Appl	Sequence 5, Appli	Sequence 2, Appli	Sequence 2, Appli	Sequence 5709, Ap	Sequence 258, App	Sequence 10, Appl	Sequence 2, Appli	Sequence 29, Appl	Sequence 2, Appli	Sequence 6, Appli	Sequence 64, Appl	Sequence 4, Appli	Sequence 8, Appli	Description

ALIGNMENTS

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TYPE: PRT
; ORGANISM: Methylomonas 16a
US-09-941-947a-8
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Best Local Similarity 41.6%; Pred. No. 5e-60;
Matches 164; Conservative 75; Mismatches 1
                                                                                                                                                                                                                                                                                                                                                                                                                                              SOFTWARE: Microsoft Office 97
SEQ ID NO 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence 8, Application US/09941947A Publication No. US20030003528A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Publication No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CURRENT APPLICATION NUMBER: US/CURRENT FILING DATE: 2001-09-01
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT: Miller, Edward S. Jr.
APPLICANT: Odom, J. Martin
APPLICANT: Picataggio, Steve
APPLICANT: Picataggio, Steve
APPLICANT: Rouviere, Pierre E.
TITLE OF INVENTION: CAROTENOID PRODUCTION FROM A SINGLE CARBON SOURCE
FILE REFERENCE: CL1903 US NA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NUMBER OF SEQ ID NOS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRIOR APPLICATION NUMBER: PRIOR FILING DATE: 2000-09
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRIOR APPLICATION NUMBER: 60/229,907 PRIOR FILING DATE: 2000-09-01
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117 RTLALANKESLVTAGQLLMRTAQENGATILPVDSEHSAVFQAL-----AGEDTACVERVI 171
                                                   59
                                                                                            61 EDCLPALREALAGT --- GTEVAGGAQAIAEAAD - RPADWTMSAIVGAAGLVPGMRALKHG 116
                                                                                                                                                                       1 MRSLSIFGATGSIGESTFDLVMRKGGPEAFRTVALTGGRNIRRLAEMARALKAELAVTAH 60
                                                                                                                                                  1 MKGICILGATGSIGVSTLDVVARH--PDKYQVVALTANGNIDALYEQCLAHHPEYAVVVM 58
                                              ESKVAEFKORIAASPVADIKVLSGSEALQQVATLENVDTVMAAIVGAAGLLPTLAAAKAG 118
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                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local Similarity
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRIOR APPLICATION NUMBER: 60/229,907
PRIOR FILING DATE: September 1, 2001
NUMBER OF SEQ ID NOS: 24
SOFTWARE: Microsoft Office 97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CURRENT APPLICATION NUMBER: CURRENT FILING DATE: 2001-(
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT: Cheng, Qiong
TITLE OF INVENTION: Genes Involved in Isoprenoid Compounds Production
FILE REFERENCE: CL1646 US NA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICANT: Koffas, Mattheos
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                                                                                                                                                                                                                                                                                                                                                                                                            LENGTH: 394
TYPE: PRT
ORGANISM: Methylomonas
FEATURE:
   239
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                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                       MRSLSIFGATGSIGESTFDLVMRKGGPEAFRTVALITGGRNIRRLAEMARALKAELAVTAH 60
                           PDRIEAVVHPQSIVHAMVGFCDGGLMAHLGPADMRHAIGFALNWPGRGEVPVARIDLAQI
                                                                              ITASGGPFRDWSLERIRACTVAEAQAHPNWSMGQRISIDSASMFNKALELIETREFFGFE
                                                                                                                                           RTLALANKESLVTAGQLLMRTAQENGATILPVDSEHSAVFQAL-----AGEDTACVERVI 171
                                                                                                                                                                                                         EDCLPALREALAGT---GTEVAGGAQAIAEAAD-RPADWTMSAIVGAAGLVPGMRALKHG 116
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                                                            LTASGGPFRRTPIETLSSVTPDQAVAHPKWDMGRKISVDSATMMNKGLELIEACLLFNME
                                                                                                                        KTVLLANKEALVMSGQİFMQAVSDSGAVLLPIDSEHNAIFQCMPAGYTPGHTAKQARRIL
                                                                                                                                                                                    ESKVAEFKQRIAASPVADIKVLSGSEALQQVATLENVDTVMAAIVGAAGLLPTLAAAKAG
                                                                                                                                                                                                                                                   MKGICILGATGSIGVSTLDVVARH--PDKYQVVALTANGNIDALYEQCLAHHPEYAVVVM 58
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                                                                                                                                                                                                                                                                                                                   164;
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o. US20020102690A1
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Picataggio, Stephen
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No. US20020102690Alton,
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                                                                                                                                                                                                                                                                                                                                                                                            Amino acid sequences encoded by
                                                                                                                                                                                                                                                                                                                                 39.28;
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Pred. No. 5e-60;
5; Mismatches 1
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US-09-934-868-64
; Sequence 64, A
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PRIOR FILING DATE: 2000-09-01
NUMBER OF SEQ ID NOS: 81
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CURRENT FILING DATE: 2001-08-22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TITLE OF INVENTION: DENITRIFYING METHANOTROPHIC BACTERIAL STRAIN FILE REFERENCE: CL1596 US NA
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ORGANISM: Methylomonas
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           292 ASLIFQKPDEERFPALRLARDVMAARGLSGAAFNAAKEIALDHFIAGRIGFLDMAAVVEE : |:|| :|| :|| ::|
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                                    TLAGVSTDPLFGKVPDALEEVLAMDHLARRAAEE 385
                                                                                           MKGICILGATGSIGVSTLDVVARH--PDKYQVVALTANGNIDALYEQCLAHHPEYAVVVM 58
SMAQFKPDD-----AGSLELVLQADQDAREVARD
                                                                      GHMDFEKPDLKRFPCLRLAYEAIKSGGIMPTVLNAANEIAVEAFLNEEVKFTDIAVIIER
                                                                                                                                                PDQIEVVIHPQSIIHSMVDYVDGSVLAQMGNPDMRTPIAHAMAWPERFDSGVAPLDIFEV
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Schenzle, Andreas
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41.6%;
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Pred. No. 5e-60;
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J.

US-09-923-556-6

Sequence 6, Application US/09923556 Patent No. US20020058321A1 GENERAL INFORMATION:

APPLICANT: Busch, APPLICANT: Hain,

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Best Local Similarity
"atches 162; Conserva
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                                        PRIOR APPLICATION NUMBER: 60/129,899
PRIOR FILING DATE: 1999-04-15
PRIOR APPLICATION NUMBER: 60/146,461
PRIOR FILING DATE: 1999-07-30
                                                                                                                                  CURRENT APPLICATION NUMBER: US/09/987,025
CURRENT FILING DATE: 2001-11-13
PRIOR APPLICATION NUMBER: 09/549,787
PRIOR FILING DATE: 2000-04-14
                                                                                                                                                                                                                       APPLICANT: Boronat, Albert
APPLICANT: Campos, Narcisco
APPLICANT: Kishore, Ganesh M.
TITLE OF INVENTION: Nucleic Acid Sequences
TITLE OF INVENTION: Isoprenoid Synthesis
FILE REFERENCE: 17142/02/US
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CURRENT FILING DATE: 2001-08-07
PRIOR APPLICATION NUMBER: EARLIER APPLICATION NUMBER: US/09/449,335
PRIOR FILING DATE: EARLIER FILING DATE: 1999-11-24
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ITTLE OF INVENTION: Method of determining the activity of
ITTLE OF INVENTION: 1-deoxy-D-xylulose-5-phosphate reductoisomerase
ITTLE OF INVENTION: 1-deoxy-D-xylulose-5-phosphate synthase
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  179 FRDWSLERIRACTVAEAQAHPNWSMGQRISIDSASMFNKALELIETREFFGFEPDRIEAV 238
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                          SEQ ID NOS:
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Windows Version
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Pred. No. 9.9e-57;
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; TYPE: PRT; ORGANISM: Arabidopsis US-09-987-025-2
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; Sequence 29, Application US/10047412A; Publication No. US20020197696A1; GENERAL INFORMATION:
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                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT: Levin, Joshua Z. APPLICANT: Budziszewski, Gregory
                                                                                                                                                                                                                                                                                                                  NUMBER OF SEQ ID NOS: 29
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                                                                                                                                        FEATURE:
NAME/KEY:
                                                                                                                                                                                                                                    LENGTH: 477
TYPE: PRT
ORGANISM: Arabidopsis thaliana
                                          LOCATION: (162)
OTHER INFORMATION:
                                                                                                         LOCATION: (155)
OTHER INFORMATION:
                                                                            NAME/KEY: SITE
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; LENGTH: 477
; TYPE: PRT
; ORGANISM: Arabidopsis
US-09-923-556-2
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SEQ ID NO 2
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                                                                                                                                                                        Query Match
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APPLICANT: Kloti, Andreas
TITLE OF INVENTION: Method of determining the activity of
TITLE OF INVENTION: 1-deoxy-D-xylulose-5-phosphate reduc-
TITLE OF INVENTION: 1-deoxy-D-xylulose-5-phosphate synthe
FILE REFERENCE: 2020US
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CURRENT FILING DATE: 2001-08-07
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APPLICANT:
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APPLICANT: Hain, Rudig
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LOCATION: (465
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                                                       RSLSIFGATGSIGESTFDLVMRKGGPEAFRTVALTGGRNIRRLAEMARALKAELAVTAHE 61
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KPISIVGSTGSIGTQTLDIVAE--NPDKFRVVALAAGSNVTLLADQVRRFKPALVAVRNE 138
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Martin, William
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Pred. No. 2.
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                                                                                                              Score 737.5; DB 1
Pred. No. 2.2e-56;
1; Mismatches 141
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; ORGANISM: Arabidopsis thaliana US-10-047-412A-10
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Matches
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SEQ ID NO 10
LENGTH: 477
TYPE: PRT
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT: Budziszewski, Gregory J.
APPLICANT: Potter, Sharon L.
APPLICANT: Wegrich, Lynette M.
TITLE OF INVENTION: Herbicide Target Genes
FILE REFERENCE: PB/5-30780DIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CURRENT APPLICATION NUMBER: US/10/047,412A CURRENT FILING DATE: 2002-04-11 NUMBER OF SEQ ID NOS: 29
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                       296
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Local Similarity
wes 163; Conserv
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2 RSLSIFGATGSIGESTFDLVMRKGGPEAFRTVALTGGRNIRRLAEMARALKAELAVTAHE 61
FQKPDEERFPALRLARDVMAARGLSGAAFNAAKEIALDHFIAGRIGFLDMAAVVEETL---
                                                                                                                                                                                  FRDWSLERIRACTVAEAQAHPNWSMGQRISIDSASMFNKALELIETREFFGFEPDRIEAV 238
                                                                                                                                                                                                                                                                                                                                                                          FQKPDEERFPALRLARDVMAARGLSGAAFNAAKETALDHFTAGRTGFLDMAAVVEETL--
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                                                                                                           VHPQSIVHAMVGFCDGGLMAHLGPADMRHAIGFALNWPGR---GEVPVARIDLAQIASLT
                                                                                                                                                                                                                                                                                                LALANKESLYTAGOLLMRTAQENGATILPVDSEHSAVFQALAGEDTACVERVIITASGGP 178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           HRNELVTSP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -- AGVSTDPLFGKVPDALEEVLAMDHLARRAA 383
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                                                                  IHPQSIIHSMIETQDSSVLAQLGWPDMRLPILYTMSWPDRVPCSEVTWPRLDLCKLGSLT
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, Joshua Z.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             37.1%; Score 736; DB 9; Length 477; 40.5%; Pred. No. 3e-56; tive 74; Mismatches 143; Indels
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439 HRNELVTSP--

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379 FKKPDNVKYPSMDLAYAAGRAGGTMTGVLSAANEKAVEMFIDEKISYLDIFKVVELTCDK 438

US-09-712-363-258

GENERAL INFORMATION:

APPLICANT:

PRIOR FILING DATE:

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; ORGANISM: Mycobacterium tuberculosis US-09-712-363-258
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PRIOR APPLICATION NUMBER: PCT/US00/02246 PRIOR FILING DATE: 2000-01-28
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CURRENT APPLICATION NUMBER: US/09/712,363
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TITLE OF INVENTION: DETERMINING THE FUNCTIONS TITLE OF INVENTION: INTERACTIONS OF PROTEINS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RIOR APPLICATION NUMBER: 60/117,844
RIOR FILING DATE: 1999-01-29
                                       292 ASLTFQKPDEERFPALRLARDVMAARGLSGAAFNAAKEIALDHFIAGRIGFLDMAAVVEE
                                                                                                                                                                                                                                                                                                         112 ALKHGRTLALANKESLYTAGQLLMRTAQENGATILPVDSEHSAVFQALAGEDTACVERVI 171
                                                                                                                                                                                                                 172 ITASGGPFRDWSLERIRACTVAEAQAHPNWSMGQRISIDSASMFNKALELIETREFFGFE 231
                                                                                                                                                                                                                                                                                                                                                   79 RQRAQTGVTNIAVADEHAAQRVGDIPYHGSDAATRLVEQTEADVVLNALVGALGLRPTLA 138
                                                                                                                                                                                                                                                                                                                                                                                              66 ALREALAGTGTEVAG--GAQAI-----AEAADR-----PADWTMSAIVGAAGLVPGMR 111
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FILING DATE: 1999-05-14
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                                                                                     YDRIDVVVHPQSIIHSMVTFIDGSTIAQASPPDMKLPISLALGWPRRVSGAAAACDFHTA 316
                                                                                                                 PDRIEAVVHPQSIVHAMVGFCDGGLMAHLGPADMRHAIGFALNWPGRGEVPVARIDLAQI 291
                                                                                                                                                                            LTASGGPFRGWSAADLEHVTPEQAGAHPTWSMGPMNTLNSASLVNKGLEVIETHLLFGIP
                                                                                                                                                                                                                                                                  ALKTGARLALANKESLVAGGSLVLRAARP--GQIVPVDSEHSALAQCLRGGTPDEVAKLV
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  SSWEFEPLDTDVFPAVELARQAGVAGGCMTAVYNAANEEAAAAFLAGRIGFPAIVGIIAD
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Marcotte, Edward M.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 628; DB 9;
Pred. No. 6.9e-47;
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BY COMPARATIVE ANALYSIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 436;
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US-09-738-626-5709
RESULT 11
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Best Local Similarity 37.4%;
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PRIOR FILING DATE: 1999-12-16
PRIOR APPLICATION NUMBER: JP 00/159162
PRIOR FILING DATE: 2000-04-07
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CURRENT APPLICATION NUMBER: US/09/738,626
CURRENT FILING DATE: 2000-12-18
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                                                                355 QGASQ---FAGVASHVDDILATESEARARA 381
                                                                                                          354 AGVSTDPLFGKVPDALEEVLAMDHLARRAA 383
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TATEISHI, NAOKO
SENOH, AKIHIRO
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Query Match Best Local Similarity Matches 155;

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SOFTWARE: FastSEQ SEQ ID NO 258

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RESULT 12
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                                                                                GENERAL INFORMATION:
                                                                                                 Sequence 2, Application US/09861289 Patent No. US20020110897A1
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Patent No. US20020164742A1
   APPLICANT:
TITLE OF I
                                                                 APPLICANT: Sherman, D.H
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CURRENT FILING DATE: 2001-05-18
PRIOR APPLICATION NUMBER: 09/105,537
PRIOR FILING DATE: 1998-06-26
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FILE REFERENCE: 600.438US1
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SOFTWARE: FastSEQ for
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   INVENTION:
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Xue, Y.
                                  Liu, H.
Xue, Y.
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; LENGTH: 5215
; TYPE: PRT
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CURRENT FILING DATE: 2001-05-18
PRIOR APPLICATION NUMBER: 09/105,537
PRIOR FILING DATE: 1998-06-26
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FILE REFERENCE: 600.438US1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ORGANISM: Streptomyces venezuelae
                                                                         1907
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1967 LSLTDQPWLADHMVNGAVLLPATAFLELALAAGDHVGAVRVEELTLEAPLVLPE 2020
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1568 LYTGEPARAGRTAFLFTGQGAQRVAMGEELRAAHPYFAAALDTVYAALDRHLDRPLREIV
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                                                                         FFPDGRRTDLPTYAFRREHYWLTPEARTDARALGFDPARHPLLTTTVEVAGGDGVLLTGR
                                                                                                                                                  DAVLTALAEEALAPGT-DAPDAR-DVTVVPLLRAGRPEPETLAAGLATAHVHGAPLDRAS
                                                                                                                                                                                                                                                                                                                                    -RDWSLERIRACTVAEAQAHPNWS-MGQRI-----SIDSASMFNKALELIETREFFGF 230
                                                                                                                                                                                                                                                                                                                                                                     RLVTARGRLMQSAREGGA-MIAVQAGEAEVVESLKGYE----GRVAVAAVNGPTAVVVSG
                                                                                                                                                                                                                                                                                                                                                                                                         SLVTAGQLLMRTAQENGATILPVDSEHSAVFQALAGEDTACVERVIITASGGPF-----
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                                    AFNAAKEIALDHFIAGRI-----GFLDMAAVVEETLAGVSTDPLFGKVPDALEE 371
                                                                                                                                                                                     ADMRHAIGFALNWPGRGEVPVARIDLAQIASLTFQKPDEE---
                                                                                                                                                                                                                        EEPRIPVV---STVTGALVTSGELTSPAYWVDQIRRPVRFLDAVRTLAAQDATVLVEIGP
                                                                                                                                                                                                                                                          EPDRIEAVVHPQSIVHAMV-----
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Pred. No. 1.1;
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                                                                                                               -----RFPALRLARDVMAARG--LSGA
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                                                                                                                                                                                                                                                            ----GFCDGGLMAHLGP
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US-10-014-71-5

US-10-014-717-5

Sequence 5, Application US/10014717

Publication No. US20020192778A1

GENERAL INFORMATION:

GENERAL INFORMATION:

APPLICANT: Ligon, James

APPLICANT: Ligon, James

APPLICANT: Schupp, Thomas

APPLICANT: Zirkle, Ross

APPLICANT: Gorlach, Joern

APPLICANT: Goerlach, Joern

TITLE OF INVENTION: GENES FOR THE BIOSYNTHESIS OF

FILE REFERENCE: 4-30582A

CURRENT FILING DATE: 1990-06-17

NUMBER OF SEQ ID NOS: 30

SOFTWARE: Patentin Ver. 2.0
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US-09-308-207-67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence 67, Application US/09308207 Publication No. US20030022323A1 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
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Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQ ID NO 5
LENGTH: 7257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    5778 DRLSV-----AVSNSPRSTVLAGE-PAALAEVLAI 5806
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               5510 VSSFGVSG----TNAHVVLEEAPAAAFAPAAARSAELFVLSAKSAAALDAQAARLSAHVV 5565
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     5566 AHPELGLGDLAFSLATTRSPMTYRLAVAATSREALSAALD-----TAAQGQAPPA 5615
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      5616 AARGHAST-GSAPKVVFVFPGQ------GSQWLGMGQKLLSEEPVFRDAL 5658
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           344
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               164 TACVERVIITASGGPFRDWSLERIRACTVAEAQAHPNWSMGQRISIDSASMFNKALELIE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           111 RALKHGRTLALANKESLVTAGQLLMRTAQENGATILPVDSEHSAVFQALAGED----- 163
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              APPLICATION NUMBER: 60/030,601
FILING DATE: 13-NOV-1996
ATTORNEY/AGENT INFORMATION:
NAME: Glaister, Debra
REGISTRATION NUMBER: 33,888
REFERENCE/DOCKET NUMBER: GC 36
                                                                                                                                                                                                                                                                                                 COMPUTER READABLE FORM:
MEDIUM TYPE: Diskette
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICANT: MARIA DIAZ-TORRES ET AL.
TITLE OF INVENTION: METHOD FOR THE RECOMBINANT
PRODUCTION OF 1,3 PROPANED
TELECOMMUNICATION INFORMATION:
                                                                                                                                      PRIOR APPLICATION DATA:
                                                                                                                                                                                                                  CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TREFFGFEPDRIEAVVHPQSIVHAMVGFCDGGLMAHLGPADMRHAIGFALNWPGRGEVPV 283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DMAAVVEETLAGVSTDP----LFGKVPDALEEVLAM
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AHEDC-LPALREALAGTGTEV-----AGGAQAIAEAADRPADWTMSAIVGAAGLVPGM 110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ARIDLAQIASLTFQKPDEERFPALRLARDVMAARGLSGAAFNAAKEIALDHFIAGRIGFL 343
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                                                                                                                                                                                                                                 OPERATING SYSTEM: Windows SOFTWARE: FastSEQ for Windows Version
                                                                                                                                                      CLASSIFICATION: <Unknown>
                                                                                                                                                                           APPLICATION NUMBER: US/09/308,207 FILING DATE: 13-May-1999
                                                                                                                                                                                                                                                                        COMPUTER: IBM Compatible
                                                                                                                                                                                                                                                                                                                                                         COUNTRY: U.S.A
                                                                                                                                                                                                                                                                                                                                                                                STATE:
                                                                                                                                                                                                                                                                                                                                                                                                CITY: Rochester
                                                                                                                                                                                                                                                                                                                                                                                                                                         STREET:
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                                                                                                                                                                                                                                                                                                                                      ZIP: 14618
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Pred. No. 2.4
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; MOLECULE TYPE: NO. US20030022323A1e; SEQUENCE DESCRIPTION: SEQ ID NO: 67: US-09-308-207-67
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US-09-712-363-262
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Best Local :
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                                                                                                                                                                                                                                         PRIOR EILING DATE: 2000-01-28
                                                                                                                                                                                                                                                                                    CURRENT APPLICATION NUMBER: US/09/712,363
CURRENT FILING DATE: 2000-11-13
                                                                                                                                                                                                                                                                                                                          TITLE OF INVENTION: DETERMINING THE FUNCTIONS TITLE OF INVENTION: INTERACTIONS OF PROTEINS FILE REFERENCE: 07419-032001
                                                                                                                                                                                                  PRIOR APPLICATION NUMBER: 60/179,531 PRIOR FILING DATE: 2000-02-01
                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                 APPLICANT: Eisenberg, David
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TELEX: <Unknown> INFORMATION FOR SEQ ID NO: 67:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             274 QVDVAAGAEAIMKAVD--GCGKLDNVAGEAGTNIGGM--LEHVRQ------TMAEL
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    254 GGLMAHLGPADMRHAIGFALNWPGRGEVPVARIDL-----AQIASLTFQKPDEERFPAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   194 EAQAHPNWSMGQRISIDSASMFNKALELIETREFFGFEPDRIEAVVHPQSIVHAMVGFCD
                                                                        OR APPLICATION NUMBER: 60/117,844
OR FILING DATE: 1999-01-29
OR APPLICATION NUMBER: 60/118,206,
OR FILING DATE: 1999-02-01
OR APPLICATION NUMBER: 60/126,593
OR FILING DATE: 1999-03-26
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     27 PEAFRTVALTGGRNIRRLAEMARAL----KAELAVTAHED----CLPALREALAGTG---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    76 -TEVAGGAQAIAEAADRPADWTMSAIVGAAGL-VPGMRALKHGRTLALANKESLVTAGQL 133
                                      APPLICATION NUMBER: FILING DATE: 1999-05
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE CHARACTERISTICS:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                      INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 --AQGEISATHLAGAGDMVTMIIARELGLEDRYLAEEIKKYPLAKV--ESLFHLRHEDGS
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                                                                                                                                                                                                                                                                                                                                                                                                         Rotstein,
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                                    1999-05-14
1999-05-14
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                                                                                                                                                                                                                                                                                                                                                                                        , Sergio H.
, Edward M.
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PRIOR APPLICATION NUMBER: 60/165,124
PRIOR FILING DATE: 1999;11-12
PRIOR APPLICATION UMBER: 60/165,086
PRIOR FILING DATE: 1999;11-12
NUMBER OF SEQ ID NOS: 292
SOFTMARE: FastSEQ for Windows Version 4.0
SEQ ID NO 262
LENGTH: 1616
TYPE: PRT
ORGANISM: Mycobacterium tuberculosis
US-09-712-363-262
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Best Local Similarity
Matches 91; Conserve
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1470 ALPALFSGLARRPRRRQIDDTGDATSSKSALAQRLHGLAADE 1511
                                                                                                                                                                             1375 GNYSAANAFLD-GLAAHRQAAGL---AGISLAWGLWEQPGGMTAHLSSRDLA----- 1422
                                                                                                                                                                                                                                                                                                                                                                                                                                             298 KPDEERFPALRLARDVMAARGLSGAA--FNAAKEIALDHFIAGRIGFLDMAAV------ 348
                                                                                                                                                                                                              243 SIVHAMVGFCDGGLMAĤLGPADMRHAIGFALNW-----PGRGEVPVARIDLAQIASLTFQ 297
                                                                                                                                                                                                                                                                                                                                                                                                         143 ATILPVD-SEHSAVFQALAGE--DTACVE-----RVIITASGGPFRD---WS 183
                                                                                                                                                                                                                                                                                                                    184 LERIRACTVAEAQAHPNWSMGQRISIDSASMFNKALELIETREFFGFEPDRIEAVVHP-Q 242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              89 ADRPADWTMSAIVGAAĞLVPGMRALKH------GRTLALANKESLVTAGQLLMRTAQENG 142
                                          -VEETLAGVSTDPLFGKVPDALEEVLAMDHLARR----AAEE 385
                                                                                       -----RMSRSGLAPMSPAEAVELFDAA--LAIDHPLAVAT-LLDRAALDARAQAG 1469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            tch. |5.4%; Score 106.5; lal Similarity | 26.6%; Pred. No. 1.2; 91; Conservative | 38; Mismatches
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Search completed: April 15, 2003, 14:03:58 Job time : 28 secs

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Minimum
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /cgn2_6/ptodata/2/pubpna/US07_
/cgn2_6/ptodata/2/pubpna/PCT_1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /cgn2_6/ptodata/2/pubpna/US08_NEW_PUB.seq:*
/cgn2_6/ptodata/2/pubpna/US08_PUBCOMB.seq:*
/cgn2_6/ptodata/2/pubpna/US09_NEW_PUB.seq:*
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/cgn2_6/ptodata/2/pubpna/US60_NEW_PUB.seq:*
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US-10-047-412A-9

US-09-738-626-2208

0 US-09-880-107-3356

US-09-860-846-32
                                                                                                                                           0 US-09-974-300-1083

US-09-738-626-2209

9 US-09-738-626-1

0 US-99-923-556-5

US-10-047-412A-28
                                  US-09-988-384B-32
US-09-861-289-32
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US-09-934-868-63
US-09-938-956-5
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1872.152 Million cell updates/sec
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Sequence 5, Appli
Sequence 112, Appli
Sequence 1183, Ap
Sequence 1083, Ap
Sequence 2099, Ap
Sequence 2, Appli
Sequence 5, Appli
Sequence 1, Appli
Sequence 1, Appli
Sequence 2088, Ap
Sequence 3208, Ap
Sequence 32, Appli
Sequence 32, Appli
Sequence 32, Appli
Sequence 32, Appli
Sequence 5, Appli
Sequence 5, Appli
                                                                                                                                                                                                                                                                                                                        Description
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Sequence 3, Appli
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45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20
53.8	54.4	54.6	54.8	•	55.6	•	56	56	57	57.2	59.2	60	60	60	60	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2	66	66.6
4.6	4.6	4.6	4.6	4.7	4.7	4.7	4.7	4.7	4.8	4.8	5.0	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.6	5.6
1758	1233	1293	1101	2454	1308	1197	2658	1233	2307	3624	2116	88421	13842	13842	13842	15872	15872	15872	1929	1929	1314	1185	1185	88421	37948
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US-09-815-242-7825	US-09-749-728B-2	US-10-145-415-31	US-09-925-301-9	US-09-815-242-4138	US-10-151-832-1	US-10-151-832-2	US-09-815-242-4035	US-10-145-415-102	US-09-893-519A-87	US-09-988-462-6	US-10-042-523-1	US-09-976-059-1	US-09-861-289-30	US-09-988-384B-30	US-09-860-846-30	US-09-861-289-1	US-09-988-384B-1	US-09-860-846-1	US-09-364-847-60	US-09-364-847-58	US-10-145-415-100	US-09-942-891-9	US-09-364-847-52	US-09-976-059-1	US-09-988-384B-5
Sequence 7825, Ap	Sequence 2, Appli	Sequence 31, Appl	Sequence 9, Appli	Sequence 4138, Ap	Sequence 1, Appli	Sequence 2, Appli	Sequence 4035, Ap	Sequence 102, App	Sequence 87, Appl	Sequence 6, Appli	Sequence 1, Appli	Sequence 1, Appli	Sequence 30, Appl	Sequence 30, Appl	Sequence 30, Appl	Sequence 1, Appli	Sequence 1, Appli	Sequence 1, Appli	Sequence 60, Appl	Sequence 58, Appl	Sequence 100, App	Sequence 9, Appli	Sequence 52, Appl	Sequence 1, Appli	Sequence 5, Appli

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ALIGNMENTS

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                                                                                                                                                                                                                                                                                         ; TYPE: DNA
; ORGANISM: Methylomonas 16a
US-09-941-947A-7
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                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                            Query Match 19.0%;
Best Local Similarity 56.5%;
                                                                                                                                                                                                                                                                                                                                                                              SEQ ID NO
                                                                                                                                                                                                                                                                                                                                                                                                 SOFTWARE: Microsoft Office 97
                                                                                                                                                                                                                                                                                                                                                                                                                     PRIOR APPLICATION NUMBER: 60/229,858 PRIOR FILING DATE: 2000-09-01 NUMBER OF SEQ ID NOS: 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CURRENT APPLICATION NUMBER: US/09/941,947A
CURRENT FILING DATE: 2001-09-01
PRIOR APPLICATION NUMBER: 60/229,907
PRIOR FILING DATE: 2000-09-01
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT: ROUVIER, PIETRE E.
TITLE OF INVENTION: CAROTENOID PRODUCTION FROM
FILE REFERENCE: CL1903 US NA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT: Brzostowicz, Patricia C. APPLICANT: Cheng, Qiong APPLICANT: DiCosimo, Deana J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT:
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                                       343 GCCAAGGCCGGCAAAACCGTGCTGTTGGCCAACAAGGAAGCCTTGGTGATGTCGGGACAA 402
                                                               337 CTGAAGCACGGCCGCCGCGCCTCGCCAACAAGGAAAGCCCTCGTGACGGCAGGGCAA 396
                                                                                                                                             277 GCCGACTGGACCATGTCGGCCATCGTGGGCGCGCGGGCCTCGTGCCCGGAATGCGGGGC 336
                                                                                                                       283 GTCGATACGGTGATGGCGGCTATCGTCGGCGCGGCCGGATTGTTGCCGACCTTGGCCGCG 342
397 CTCCTGATGCGGACGGCCCAGGAGAACGGCGCCACGATCCTGCCGGTGGACAGCGAGCAC 456
                                                                                                                                                                                                          446;
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DiCosimo, Deana J.
Koffas, Mattheos
Miller, Edward S. Jr.
Codom, J. Martin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Picataggio, Steve
                                                                                                                                                                                                          Conservative
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Pred. No. 2.5
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RESULT 2
US-09-934-903-3
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Patent No. US20020102690A1
                                              SEQ ID NO 3
                                                                                                                                                                                                                                           APPLICANT:
APPLICANT:
                                                                       PRIOR APPLICATION NUMBER: 60/229,907
PRIOR FILING DATE: September 1, 2001
NUMBER OF SEQ ID NOS: 24
                                                                                                                     APPLICANT: Picataggio, Stephen
APPLICANT: Cheng, Qiong
TITLE OF INVENTION: Genes Involved in Isoprenoid
FILE REFERENCE: CL1646 US NA
CURRENT APPLICATION NUMBER: US/09/934,903
CURRENT FILING DATE: 2001-08-22
                                                            SOFTWARE: Microsoft Office
                                                                                                                                                                                                               APPLICANT:
                                                                                                                                                                                                                            APPLICANT:
               LENGTH: 1182
TYPE: DNA
    ORGANISM: Methylomonas
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TTCGGCTTCGAGCCGGACCGGATCGATGGGTCGTCCATCCGTCCATGCG 741
                                                                                                                                                                                                                                                                                                                                                                                                            ATCATCGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                        GTGGTCGAG 1050
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Schenzle, Andreas J.
No. US20020102690Alton,
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US-09-934-868-63
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; Patent No. US20020137190A1
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APPLICANT:
APPLICANT:
              JENERAL INFURDALA....
APPLICANT: Koffas, Mattheos
APPLICANT: Odom. James M
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Odom, James Schenzle, Ar

Andreas

US/09934868

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; OTHER INFORMATION: US-09-934-903-3
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pred. No. 2.5e-43;
0; Mismatches 328;
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; OTHER INFORMATION: DXR
US-09-934-868-63
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SEQ ID NO 63
LENGTH: 1182
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CURRENT FILING DATE: 2001-08-22
PRIOR APPLICATION NUMBER: 60/229,858
PRIOR FILING DATE: 2000-09-01
NUMBER OF SEQ ID NOS: 81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TYPE: DNA
ORGANISM: Methylomonas
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                                   AATGAAATTGCTGTCGAAGCGTTTTTAAATGAAGAAGTCAAATTCACTGACATCGCGGTC
                                                         AAGGAGATCGCGCTCGATCATTCATCGCCGGACGCATCGGGTTTCTGGACATGGCGGCG
                                                                                                     AGATTGGCTTATGAAGCCATCAAGTCTGGTGGAATTATGCCAACGGTATTGAACGCAGCC
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; ORGANISM: Plasmid
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
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CURRENT FILING DATE: 2001-08-24
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                                                                                                                                GAGCGCGTCATCATCACGGCGTCCGGCGGGCCGTTCCGCGACTGGAGCCTCGAGCGCATC
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CCGATAGCGCACGCGATGGCCTGGCCGGAACGCTTTGACTCTGGTGGCGCCGCTGGAT 3938
                            GCCATCGGATTCGCGCTGAACTGGCCGGGTCGCGGCGAGGTGCCCGGTCGCCCGGATCGAC
                                                                                              ATGGTGGGCTTCTGCGACGGGGGCCTGATGGCCCATCTCGGCCCCGCCGACATGCGCCAC
                                                                                                                                                                 TTCGGCTTCGAGCCGGACCGGATCGAGGCGGTCGTCCATCCGCAATCCATCGTCCATGCG
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                                                                                                                                                                                                                                    TCCATCGACAGCGCCTCGATGTTCAACAAGGCGCTCGAGCTGATCGAGACGCGCGAATTC
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Pred. No. 2e-43;
0; Mismatches 328;
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US-09-712-363-112
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LENGTH: 1311
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                                                                                                                                                                                                                                                                                              Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                            Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRIOR APPLICATION NUMBER: PCT/US00/02246
PRIOR FILING DATE: 2000-01-28
PRIOR APPLICATION NUMBER: 60/179,531
PRIOR FILING DATE: 2000-02-01
PRIOR APPLICATION NUMBER: 60/117,844
PRIOR FILING DATE: 1999-01-29
PRIOR FILING DATE: 1999-01-29
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APPLICANT: Marcotte, Edward M.
TITLE OF INVENTION: INTERACTIONS OF PROTEINS
TITLE OF INVENTION: INTERACTIONS OF PROTEINS
FILE REFERENCE: 07419-032001
                                                                                                                                                                                                                                                                                                                                                                                          LENGTH: 13
TYPE: DNA
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SOFTWARE: FastSEQ for Windows Version 4.0
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CURRENT FILING DATE: 2,000-11-13
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OR APPLICATION NUMBER: 60/126, 593
OR FILING DATE: 1999-03-26
OR APPLICATION NUMBER: 60/134, 093
OR FILING DATE: 1999-05-14
OR APPLICATION NUMBER: 60/134, 092
OR FILING DATE: 1999-05-14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FILING DATE: 1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICATION NUMBER: 60/165,086
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICATION NUMBER: 60/165,124 FILING DATE: 1999-11-12
CGTGACGGCAGGGCAACTCCTGATGCGGACGGCCCAGGAGAACGGCGCCACGATCCTGCC 440
                                                                                                                                                     GGCCGCCGACCGGCCGACTGGACCATGTCGGCCATCGTGGGCGCCGCGGGCCTCGT 320
                                                          GGTCGAGCAGACCGAGGCCGACGTCGTCCTCAATGCGCTGGTCGGCGCGCTTGGGCCCTGCG 401
                                                                                                                                                                                             GCACGCGGCGCAGCGGGTCGGCGACATCCCCTACCACGGATCCGACGCCGCCCACCCGGCT 341
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                                      ACCGACGTTGGCCGCGCTCAAGACGGGTGCCCGGCTGGCCCTGGCCAACAAGGAATCGCT
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                                                                                                                                                                                                                                                                                              Score 215.6; DB 9; Pred. No. 2.4e-41;
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BY COMPARATIVE ANALYSIS
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US-09-974-300-1083
                                  SEQ ID NO 1083
LENGTH: 1115
TYPE: DNA
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                                                                                                                                                                                                                                                                                                                                                                     Sequence 1083, Application US/09974300 Patent No. US20020146721A1
                                                                                                                                                                       CURRENT APPLICATION NUMBER: US/09/974,300 CURRENT FILLING DATE: 2001-10-05 PRIOR APPLICATION NUMBER: 09/680,598 PRIOR FILING DATE: 2000-10-06
                                                                                                                                                                                                                                                    APPLICANT: Clausen. Ib Groth
TITLE OF INVENTION: Methods For Monitoring Multiple
TITLE OF INVENTION: Expression
FILE REFERENCE: 10085.500-US
                                                                                           PRIOR APPLICATION NUMBER: 60/279,526
PRIOR FILING DATE: 2001-03-27
NUMBER OF SEQ ID NOS: 8481
SOFTWARE: FastSEQ for Windows Version
                                                                                                                                                                                                                                                                                                                 APPLICANT: Berka, Randy M. APPLICANT: Clausen, Ib Gr
                ORGANISM: Bacillus
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Query Match

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Best Local Similarity
Matches 535; Conserv
GCATCGGGTTTCTGGACATGGCGGCGGTGGTCGAGGAGACGCTCGCGGGC 1065
                                                                    TCGGCCCCGCCGATGCGCCATCGCATTCGCGCTGAACTGGCCGGGTCGCGGCG
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                                                                                                                                                                                                            CGTTTAATGAAGCAAAATCCCTCGATCTCTGGGAAGTCGGACAGCTGAATTTTGCCCCAAG
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                                                                                                                 TGTCGGGCGCCGCCTTCAACGCGGCCAAGGAGATCGCGCTCGATCATTTCATCGCCGGAC 1015
                                                                                                                                                               CTGATTTTGAAAGGTTCCGCTGCTTACAATTCGCTTATGAATCAGGTAAAATAGGCGGTA
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SEQ ID NO 2209
LENGTH: 1176
TYPE: DNA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT: NAKAGAWA, SATOSHI
APPLICANT: MIZOGUCHI, HIROSI
APPLICANT: ANDO, SEIKO
APPLICANT: HAYASHI, MIKIRO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CURRENT APPLICATION NUMBER: US/09/738,626
CURRENT FILING DATE: 2000-12-18
PRIOR APPLICATION NUMBER: JP 99/377484
PRIOR FILING DATE: 1999-12-16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICANT: OZAKI, AKIO
TITLE OF INVENTION: NOVEL POLYNUCLEOTIDES
FILE REFERENCE: 249-125
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CGACGGGGGCCTGATGGCCCATCTCGGCCCCGCCGACATGCGCCACGCCATCGGATTCGC
                                              GGATCTCATTGATGTGACGGTGCATCCGCAGTCGATCATCCACTCCATGATCACGTTTAC
                                                                                        GGACCGGATCGAGCCGGTCGTCCATCCGCAATCCATCGTCCATGCGATGGTGGGCTTCTG
                                                                                                                                         CACCCTTATTAATAAAGGCCTCGAACTCATCGAGGCGACCCTGCTTTTGAAAACGGATGC
                                                                                                                                                                                      CTCGATGTTCAACAAGGCGCTCGAGCTGATCGAGACGCGCGAATTCTTCGGCTTCGAGCC
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TATEISHI, NAOKO
SENOH, AKIHIRO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             OCHIAI, KEIKO
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Pred. No. 3.4e-25;
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US-09-738-626-1/c
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT: NAKAGAWA, SATOSHI
APPLICANT: MIZOGUCHI, HIROSHI
APPLICANT: ANDO, SEIKO
APPLICANT: HAYASHI, MIKIRO
APPLICANT: OCHIAL, KEIKO
APPLICANT: YOKOI, HARÜHIKO
                                                                                                                                                                                                                                              Query Match
Best Local Similarity
Matches 397; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 1, Application US/09738626 Publication No. US20020197605A1
                                                                                                                                                                                                                                                                                                                                                                                                                                        PRIOR APPLICATION NUMBER: JP 00/280988
PRIOR FILING DATE: 2000-08-03
NUMBER OF SEQ ID NOS: 7059
SOFTWARE: Patentin ver: 3.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CURRENT APPLICATION NUMBER: US/09/738,626
CURRENT FILING DATE: 2000-12-18
PRIOR APPLICATION NUMBER: JP 99/377484
PRIOR FILING DATE: 1999-12-16
PRIOR APPLICATION NUMBER: JP 00/159162
PRIOR FILING DATE: 2000-04-07
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APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TITLE OF INVENTION: NOVEL POLYNUCLEOTIDES FILE REFERENCE: 249-125
                                                                                                                                                                                                                                                                                                                                                  LENGTH: 3309400
TYPE: DNA
ORGANISM: Corynebacterium glutamicum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT:
                                                                                                        336 GCTGAAGCACGGCCGCACGCTGGCGCTCGCCAACAAGGAAAGCCTCGTGACGGCAGGGCA 395
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                                                                                                                                                                                                         276 GGCCGACTGGACCATGTCGGCCATCGTGGGCGCGCGGGCCTCGTGCCCGGAATGCGGGC 335
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                                       396 ACTCCTGATGCGGACGGCCCAGGAGAACGGCGCCACGATCCTGCCGGTGGACAGCGAGCA 455
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                                                                                                                                                                  GGCCGACACTGTGCTTAATGCTCTGGTTGGTTCTTTGGGGCCTTGCGGCAACGCTGGCCAC 2130735
GTTTGTTACCTCAAAGCCAAAGCTG-----GGGCAGATCATTCCGGTCGATTCGGAGCA 2130621
                                                                                TCTGGAATCTGGTGCGCATCTTGCCTTGGCTAACAAAGAATCGCTGGTTGCCCGGTGGTGA 2130675
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SENOH, AKIHIRO
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OZAKI, AKIO
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                                                                                                                                                                                                                                                  Score 145.8; DB 9;
Pred. No. 1.7e-25;
0; Mismatches 392;
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                                                                                                                                                                                                CURRENT APPLICATION NUMBER: US/09/923,556

CURRENT FILING DATE: 2001-08-07

PRIOR APPLICATION NUMBER: EARLIER APPLICATION NUMBER: US/09/449,335

PRIOR FILING DATE: EARLIER FILING DATE: 1999-11-24

NUMBER OF SEQ ID NOS: 8

SOFTWARE: Patentin Ver. 2.1

SEQ ID NO 5...
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                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICANT: Tietjen, Klaus
APPLICANT: Kloti, Andreas
TITLE OF INVENTION: Method of determining the activity of
TITLE OF INVENTION: 1-deoxy-D-xylulose-5-phosphate reductoisomerase
TITLE OF INVENTION: 1-deoxy-D-xylulose-5-phosphate synthase
FILE REFERENCE: 2020US
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT: Busch, Marco
APPLICANT: Hain, Rudiger
APPLICANT: Martin, William
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2130020
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                                                                                                LENGTH: 1732
TYPE: DNA
ORGANISM: Arabidopsis thaliana
NAME/KEY: CDS
LOCATION: (18)..(1448)
OTHER INFORMATION: new
                                                                                            FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1056 GCTCGCGGCGTTTC 1070
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                696 GGACCGGATCGAGGCGGTCGTCCATCCGCAATCCATCGTCCATGCGATGGTGGGCTTCTG 755
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        516 CACGGCGTCCGGCGGGCCGTTCCGCGACTGGAGCCTCGAGCGCATCCGCGCCTGCACCGT 575
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              756 CGACGGGGGCCTGATGGCCCATCTCGGCCCCGCCGACATGCGCCACGCCATCGGATTCGC 815
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CGATCATTTCATCGCCGGACGCATCGGGTTTCTGGACATGGCGGCGGTGGTCGAGGAGAC
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coding
   sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                and
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293 CGGCCATCGTGGGCGCCGCGGGCCTCGTGCCCGGAATGCGGGCGCTGAAGCACGGCCGCA 352

Local

Similarity

10.6%;

Score 125.2; DB 10; Pred. No. 1.9e-20; 0; Mismatches 383;

Length 1732

9; Gaps

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Sequence 28, Application US/10047412A

Publication No. US20020197696A1

GENERAL INFORMATION:
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                                                              APPLICANT: Levin, Joshua Z.
APPLICANT: Budziszewski, Gregory J.
APPLICANT: Potter, Sharon L.
APPLICANT: Wegrich, Lynette M.
TITLE OF INVENTION: Herbicide Target Genes and
FILE REFERENCE: PB/5-30780DIV
CURRENT APPLICATION NUMBER: US/10/047,412A CURRENT FILING DATE: 2002-04-11 NUMBER OF SEQ ID NOS: 29
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; LOCATION: (1)..(1434)
; OTHER INFORMATION: y =
US-10-047-412A-28
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Best Local Similarity 48.6%;
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TCATCGCCGGACGCATCGGGTTTCTGGACATGGCGGCGGTGGTCGA 1049
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                                                           GAGCTGGAGGCACAATGACTGGAGTTCTCAGCGCCCCAATGAGAAAGCTGTTGAAATGT
                                                                                                      CGGCGCGCGCCTGTCGGGCGCCGTTCAACGCGGCCAAGGAGATCGCGCTCGATCATT
                                                                                                                                                  CTTTCAAGAAACCAGACAATGTGAAAATACCCATCCATGGATCTTGCTTATGCTGCTGGAC
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RESULT 11 US-09-923-556-1 ; Sequence 1, Application US/09923556 ; Patent No. US20020058321A1

GENERAL INFORMATION

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; NAME/KEY: CDS
LOCATION: (18)..(1448)
; OTHER INFORMATION: DNA encoding 1-deoxy-D-xylulose-5-phosphate
; OTHER INFORMATION: reductoisomerase
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APPLICANT: Martin, William
APPLICANT: Tietjen, Klaus
APPLICANT: Tietjen, Klaus
APPLICANT: Kloti, Andreas
TITLE OF INVENTION: Method of determining the activity of
TITLE OF INVENTION: 1-deoxy-D-xylulose-5-phosphate reductoisomerase
TITLE OF INVENTION: 1-deoxy-D-xylulose-5-phosphate synthase
FILE REFERENCE: 2020US
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CURRENT APPLICATION NUMBER: US/09/923,556
CURRENT FILING DATE: | 2001-08-07
PRIOR APPLICATION NUMBER: EARLIER APPLICATION FILING DATE: EARLIER FILING DATE: 11
NUMBER OF SEQ ID NOS: | 8
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TYPE: DNA
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                                  CCTTCCAGAAGCCTGACGAGGAACGCTTTCCGGCCCTGAGGCTTGCGCGAGACGTCATGG
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CTTTCAAGAAACCAGACAATGTGAAATACCCATCCATGGATCTTGCTTATGCTGCTGGAC
                                                                                                             GCGGC-----GAGGTGCCCGTCGCCCGGATCGACCTCGCACAGATTGCGAGCCTCA
                                                                                                                                                   CTCAATTGGGTTGGCCTGATATGCGTTTACCGATTCTCTACACCATGTCATGGCCCGATA
                                                                                                                                                                                       CCCATCTCGGCCCGGCGACATGCGCCACGCCATCGGATTCGCGCTGAACTGGCCGGGTC
                                                                                                                                                                                                                            CTTTTAGGGATTGGCCTGTCGAAAAGCTAAAGGAAGTTAAAGTAGCGGATGCGTTGAAGC
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Pred. No. 4.5e-20;
0; Mismatches 384;
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; NAME/KEY: CDS
; LOCATION: (1)..(1434)
US-10-047-412A-9
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US-10-047-412A-9
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CURRENT FILING DATE: 2002-04-11
NUMBER OF SEQ ID NOS: 29
SOFTWARE: PatentIn Ver. 2.1
SEQ ID NO 9
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Best Local
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APPLICANT: Budziszewski, Gregory
APPLICANT: Potter, Sharon L.
APPLICANT: Wegrich, Lynette M.
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APPLICANT: Wegrich, Lynette M.
TITLE OF INVENTION: Herbicide Target Genes
FILE REFERENCE: PB/5-30780DIV
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TYPE: DNA
ORGANISM: Arabidopsis
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nes 372; Conserv
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  CTCAATTGGGTTGGCCTGATATGCGTTTACCGATTCTCTACACCATGTCATGGCCCGATA 1072
                                          CCCATCTCGGCCCGGCCGACATGCGCCACGCCATCGGATTCGCGCTGAACTGGCCGGGTC
                                                                                                                                TCGTCCATCCGCAATCCATCGTCCATGCGATGGTGGGCCTTCTGCGACGGGGCCTGATGG
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                                                                                        TCATTCATCCTCAAAGTATCATACATTCCATGATTGAAACACAGGATTCATCTGTGCTTG
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; ORGANISM: Corynebacterium glutamicum
US-09-738-626-2208
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Best Local Similarity
Matches 247; Conserv
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APPLICANT: IKEDA, WASATO
APPLICANT: OZAKI, AKIO
TITLE OF INVENTION: NOVEL POLYNUCLEOTIDES
FILE REFERENCE: 249-125
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRIOR FILING DATE:
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516 CACGGCGTCCGGCGGCCGTTCCGCGGACTGGAGCCTCGAGCGCATCCGCGCCTGCACCGT 575
                                                                                                                                                                                                                                                                                                        489 GGCCGACACTGTGCTTAATGCTCTGGTTGGTTCTTTGGGGCCTTGCGGCCAACGCTGGCCAC
                                                                                                  456 CTCCGCGGTCTTTCAGGCGCTGGCGGGCGAGGACACGGCCTGCGTCGAGCGCGTCATCAT
                                                                                                                                                                                                                         429 TCTGGAATCTGGTGCGCATCTTGCCTTGGCTAACAAAGAATCGCTGGTTGCCGGTGGTGA
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                                                          CTCTGCCATGGCGAGTGTTTGCGTTCGGGTACTCGTGATGAGGTTGCGCGGATTGTGCT
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OCHIAI, KEIKO
YOKOI, HARUHIKO
TATEISHI, NAOKO
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Best Local Similarity 48.9%;
Matches 222; Conservative
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PRIOR FILING DATE: 2000-10-02
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT: Vockley, Joseph G.
APPLICANT: Scherf, Uwe
APPLICANT: Gene Logic, Inc.
TITLE OF INVENTION: Gene Expression Profiles
FILE REFERENCE: 44921-5028-WO
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541 TGGCCGCCTGGGGGCTCCCTGGGGTCCGGCCGCGTAGAGGAGAAGCTGCTGGTCCTGA
                                                                                  581 GACTGCTGCCAGTGCTGGTCCAATGTGGCGGGCGGCGGCCGTGCGGGCCGTGTGGGGGCGGGC
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                                      455 ACTCCGCGGTCTTTCAGGCGCTGGCGGGCGAGGACACGGCCTGCGTCGAGCGCGTCATCA
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Pred. No. 4.4e-08;
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PRIOR APPLICATION NUMBER: 2001-05-18
PRIOR FILING DATE: 2001-05-18
PRIOR FILING DATE: 1998-06-26
NUMBER OF SEO ID NOS: 43
SOFTWARE: FastSEQ for Windows Version 3.0
SEQ ID NO 32
LENGTH: 11220
TYPE: DAM
ORGANISM: Streptomyces Venezuelae
US-09-860-846-32
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Best Local Similarity
Matches 235; Conserv
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TITLE OF INVENTION: DNA encoding methymycin and pikromycin FILE REFERENCE: 600.438US1
CURRENT APPLICATION NUMBER: US/09/860,846
CURRENT FILING DATE: 2001-05-18
CURRENT FILING DATE: 00105-18
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US20020164742A1
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Xue, Y.
Zhao, L
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Pred. No. 5.9e-07;
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Search completed: April 22, 2003, 06:16:53 Job time : 3994 secs

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                                                               A2577432
10a03 Shot-gun genomic library of Rhizobium strain sp. NGR234 genomic clone 10a03, DNA sequence.
                                              AZ577432.1
Rhizobium
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08 a 211 c 161 g 87 t 3 others
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/db_xref="taxon:3055"
/clone_lib="C._reinhardtii CC-1690, Stress II (normalized
sp.
                                                GI:11603701
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                                                                               Triticum aestivum Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta; Egukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta; Eukaryota; Poales; Poaceae; Pooldea; Triticeae; Triticum.
                                                                                                                                                                                                                                       BE213317
687 bp mRNA linear EST 30-JUN-2000 EST0074 Triticum aestivum Lambda Zap Triticum aestivum cDNA clone JAl_1D_H11_T3 5' similar to Putative 1-deoxy-D-xylulose-5-phosphate
                              1 (bases 1 to 687)
Anderson, J.M., Williams, C.E. and Goodwin, S.B.
Analysis of an EST database reveals a probable
                                                                                                                                                                        EST
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                                                                                                                                                                                                                          reductoisomerase,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 University of Geneva
1 Chemin de l'Imperatrice, Chambesy/Geneva 1292, Switzerland
Tel: +44(0)1603450000
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Laboratoire de Biologie Moleculaire des
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Viprey,V., Rosenthal,A., Broughton,W.J. and Perret,X.
Genetic snapshots of the Rhizobium species NGR234 genome
Genome Biol. 1 (6), RESEARCH0014 (2000)
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               homolog in wheat
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/strain="ANU265"
/db_xref="taxon:394"
/clone="10a03"
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pNGR234a"
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                                                                                                                                                                    GACATGCGGCTACCC
                                                                                                                                                                                                                                                                          ATCGTCCATGCGATGGTGGGCTTCTGCGACGGGGGCCTGATGGCCCATCTCGGCCCCGCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               289;
BH001147
488 bp DNA linear GSS 01-JUL-2001 pl2-F2 Pirellula marina Lambda Zap Express Library Pirellula marina genomic clone pl2-F2 similar to 1-deoxy-D-xylulose 5-phosphate reductoisomerase, DNA sequence.

BH001147
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Contact: Anderson, J.M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         il: janderson@purdue.edu
primer: T3
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765-494-5565
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /db_xref="taxon:4565"
/clone="tAl_lD_H11_T3"
/clone_lib="Triticum aestivum Lambda
/clone_lib="Triticum aestivum Lambda
/tissue_type="leaf"
/dev_stage="9 day old seedlings"
/dev_stage="9 day old seedlings"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /strain="P29"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /organism="Triticum aestivum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ocation/Qualifiers
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TITLE
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Best Local
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GGACGCATCGGGTTTCTGGACATGGCGGCGG
                                                                                                                                                                                                                                                                                                                                                                     GTCGTCCATCCGCAATCCATCGTCCATGCGATGGTGGGCCTTCTGCGACGGGGGCCTGATG
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CATCCAACTTGNAAGATGGGCCNTAAGATTACGGTCGATTCAGCGACCATGATGAATAAG
                                                                                                                              CCGCCCGACTTGGACCGTTTTCCTGCCCTACGATTAGGGAAAGAAGCGGCCGAGCGCGGG
                                                                                                                                                                AAGCCTGACGAGGAACGCTTTCCGGCCCTGAGGCTTGCGCGAGACGTCATGGCGGCGCGC
                                                                                                                                                                                                                                    CGCGGCGAGGTGCCCGTCGCCCGGATCGACCTCGCACAGATTGCGAGCCTCACCTTCCAG
                                                                                                                                                                                                                                                                          GCGCAATTGAGCCCCCCCGACATGAAATTACCGATACAATATGCAATGTCGTTCCCGGAA
                                                                                                                                                                                                                                                                                                            GCCCATCTCGGCCCCGCCGACATGCGCCACGCCATCGGATTCGCGCTGAACTGGCCGGGT
                                                                                                                                                                                                                                                                                                                                                GCGCTCGAGGTCATTGAGGCCCGGCTGGTTGTTTGATATGCCGGCAGACAAGATAGACGTG
                                                        GGGACGACCGGAGCGGTCTTGAACGCCGCCAACGAAGCGCCGTACAGAGCTTTCTCGAC
                                                                                        GGCCTGTCGGGCGCCGTTCAACGCGGCCAAGGAGATCGCGCTCGATCATTTCATCGCC
                                                                                                                                                                                                  CGCTTCCCTGGCCCCGGCTCGAAGGCTAGACTTCACCGTCGCGTCCAGCTGGGAGTTTGAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Department of Microbiology and University of Queensland Brisbane, QLD 4072, Australia Tel: +617 3365 4643
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Pirellula marina
Bacteria; Planctomycetes; Planctomycetacia;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Contact: Fuerst JA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Unpublished (2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                division of the Domain Bacteria
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Gene discovery from sequence tags generated
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /organism="Pirellula n
/strain="ACM 3344"
/db_xref="taxon:124"
/clone="pl2-F2"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /clone_lib="Pirellula marina Lambda Zap Express Library" /note="Vector: Lambda Zap Express BamHI arms; Site_1:
BamHI; Site_2: BamHI; Purified genomic DNA from Pirellula marina was restricted with BclI to give fragments of 2-9kb and ligated into the BamHI sites of the Lambda Zap Express vector. The ligated DNA was packaged into Gigapack Gold III phage heads. E.coli XLI-Blue MRF; was infected with the packaged phage. Recombinant phage plaques were picked and stored in phage storage buffer (PSB). Phage/PSB was used as template for PCR."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 location/Qualifiers
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VERSION
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Wing,R., Close,T.J., Kleinhofs,A., Wise,R., Wei,F., Begum,D. Frisch,D., Yu,Y., Henry,D., Palmer,M., Rambo,T., Simmons,J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta; Spermatophyta; Magnoliophyta; Liliopsida; Poales; Poaceae; Pooidea
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Contact: Wing RA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Unpublished (2001)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ,D.W., Fenton,R.D., Oates,R. and Main,D.
Development of a genetically and physically anchored EST resource
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Hordeum vulgare
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Total hq bases = 563
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       for barley genomics: Blumeria infected incompatible (Mla6) seedling
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Hordeum vulgare.
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)O Jordan Hali, C
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Location/Qualifiers
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864 656 4293
                                                                                                                                                                                                                                                                         C.I. 16151 (Mla6) plants were greenhouse grown in the R
Wise lab at Iowa State University, Ames, IA; 7 day old
green seedlings were challenged with isolate 5874 (AvrMla6)
) of Blumeria graminis f. sp. hordei, and leaves were
harvested 20 and 24 hr post-inoculation and snap frozen:
uninoculated leaves were harvested 20 hr post-inoculation
(Wei, Wise). In the TJ Close lab at the University of
California, Riverside, total RNA was prepared from each
sample pool, equal quantities of all three RNA pools were
combined, poly(A) RNA was purified from the mixture, one
primary unamplified cDNA library was made, and 1 million
pfu were in vivo excised to give pBluescript SK(-) cDNA
phagemids (Choi, Close). Phagemids were plated and picked
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            rwing@clemson.edu
                                                                                                       at the Clemson University Genomics Institute (CUGI) (Begum Palmer, Frisch, Atkins and Wing). Plasmid DNA preparations, DNA sequencing and sequence analysis were performed at CUGI (Wing, Yu, Frisch, Henry, Simmons, Oates Rambo, Main). The sequence has been trimmed to remove vector sequence and contains a minimum of 100 bases of phred value 20 or above. For more details on library preparation and sequence analysis see
see Close TJ, Wing R, Kleinhofs A, Wise R (2001)
Genetically and physically anchored EST resources for
barley genomics. Barley Genetics Newsletter 31:29-30.
                                                               this clone see http://www.genome.clemson.edu/orders
                                                                                     http://www.genome.clemson.edu/projects/barley. To order
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             librafy HVcDNA0005 (Blumeria challenged)"
/tissue_type="seedling green leaf"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /clone-"HV_CEb0021C11f"
/clone-lib-"Hordeum vulgare seedling green.leaf EST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /organism="Hordeum vulgare"
/cultivar="CI16151 (Mla6)"
/db_xref="taxon:4513"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       'note
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                                                                                                                                                                                                                                                                                                                                                                            GGCCAGCGGATCTCCATCGACAGCGCCTCGATGTTCAACAAGGCGCTCGAGCTGATCGAG
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                                                     GACATGCGCC
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAGGAGACACTTATCGCAGGCGGCCCGTTCGTGCTTCCCCTTGCGCACAAGCACAATGTG 252
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                                                                                                        ATCATACACTCCATGATTGAAACCCAGGATTCATCTGTCCTGGCTCAGCTGGGCTGGCCA
                                                                                                                                          ATCGTCCATGCGATGGGCTTCTGCGACGGGGCCTGATGGCCCATCTCGGCCCCGCC
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Hordeum vulgare subsp. vulgare. Hordeum vulgare subsp. vulgare Hordeum vulgare subsp. vulgare Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tracheophyta; Eukaryota; Viridiplantae; Liliopsida; Poales; Poaceae; Pooldea 680 bp mRNA linear EST 23-MAY-20 BJ471224 K. Sato unpublished cDNA library, cv. Haruna Nijo adult, heading stage top three leaves Hordeum vulgare subsp. vulgare cDNA clone baal17f12 5', mRNA sequence. Center For Genetic Resource Information National Institute of Genetics 1111 Yata, Mishima, Shizuoka 411-8540, Japan Barley EST sequencing project in Unpublished (2002) EST Contact: Tadasu Shin-i Sato, K., BJ471224.1 GI:21149727 Triticeae; (bases 1 to 680) Yata, Mishima, 81-559-81-6856 81-559-81-6855 Saisho, D. and Takeda, K. Hordeum. NIG and Okayama EST 23-MAY-2002

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RESULT 7
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                                                                                                                                                                                    ATCATACA 676
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Mijo adult, heading stage top three
/tissue_type="top three leaves"
/dev_stage="adult, heading stage"
145 c 181 g 174 t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /organism="Hordeum vulgare/cultivar="Haruna Nijo"/db_xref="taxon:112509"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /clone="baal17f12"
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                cDNA clone Ta01_20b04,
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                  TGGGTTCGCTGACATTTAAAGCTCCCGACAACGTGAAATACCCATCGGTGGATCTCGCGT
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Tel: (613) 759-1658
Fax: (613) 759-1701
Email: ouellettr@em
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CANADA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Contact: Ouellet,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Inoculation with Fusarium Unpublished (2001)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ouellet,T., Dan,H., Koul,A., Chapados,J., Couroux,P., De Moors,A. Harris,L.J., Hattori,J.I., Robert,L.S., Singh,J.A, Sprott,D. and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Triticum aestivum
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             bread wheat
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Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note-"Vector: pGEM-T easy; Site_1: EcoRI; Site_2: EcoRI; Controled chamber grown wheat heads were spray inoculated at mid-anthesis with a Fusarium graminearum macroconidial suspension (50,000 spores/ml) and kept under intermitent misting for 24 hours, then collected and immediately frozen in liquid nitrogen."

187 g 185 t 3 others
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/dev_stage="anthesis"
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/clone="Ta01_20b04"
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/cultivar="Frontana"
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                                                                              CCCAGGAGAACGGCGCCACGATCCTGCCGGTGGACAGCGAGCACTCCGCGGTCTTTCAGG
NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNTTCTAACTGCATCAGGTGGTG
                                                            ACATAGCATTGGCAAACAAAGAGACACTTATTGCAGGTGGTCCTTTTGTGCTTCCCCTTG
                                                                                                                                                           CGCTGGCGCTCGCCAACAAGGAAAGCCTCGTGACGGCAGGGCAACTCCTGATGCGGACGG 412
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Spermatophyta; Magnoliophyta; Liliopsida; Poales;
clade; Panicoldeae; Andropogoneae; Zea.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Submitted (25-APR-2002) Maize Mapping Missouri, Columbia, MO 65211, USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Unpublished (2002)
2 (bases 1 to 1838)
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/db_xref="MaizeDB:631829"
/db_xref="taxon:4577"
/clone="CL389_1"
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                                                                                                                                                                                                                         Unpublished (2015)
Contact: Olin Anderson
US Department of Agriculture, Agriculture Research
West Area, Western Regional Research Center
ann Buchanan Street, Albany, CA 94710, USA
                                                                                                                   Email: candersnew.usda.gov
Sequence have been trimmed to remove vector
quality sequence with phred score less than
Seq primer: Stratagene SK primer.
                                                                                                                                                                                                                                                                                                                     Anderson,O.D., Chao,S., Choi,D.W., Close,T.J., Han,P. Rang,Y., Lazo,G.R., Miller,R., Nguyen H.T., Rausch,C.C.L., Tong,J.C. and Zhang,D.
The structure and function of the expressed portion genomes - Drought stressed leaf cDNA library Unpublished (2000)
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/organism="Triticum aestivum"
/cultivar="TAM W101"
/db_xref="taxon:4565"
/clone="WHE1409_A03_A05"
                                                                                                    Location/Qualifiers
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227; Conserv
                  Tanksley, S. and Baker, B. Generation of ESTs from potato roots
                                                          van der Hoeven,R., Sun,H., I
Utterback,T., Chiemingo,A.,
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Site_1: ECORI; Site_2: XhoI; Plants were given a gradual
stress down to 65% and 78% RWC at Texas Tech University
(D. Zhang in HT Wguyen lab). Total RNA and poly(A) RNA.
clones were in vivo excised to give pBluescript phagemids
in the TU Close lab (Choi, Close), at the University of
California, Riverside. Plasmid DNA preparations and DNA
sequencing were performed in the OD Anderson lab (all
other authors)."
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/lab_host="E. coli SOLR"
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/tissue_type="Leaf"
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                                                             Sun,H., Karamycheva,S.A., Tsai,J., Van Aken,S.
ningo,A., Bougri,O., Buell,C.R., Ronning,C.,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CTCGAGCTGATCGAGACGCGCGAATTCTTCGGCTTCGAGCCGGACCGGATCGAGGCGGTC
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             224;
                                                                                                                                                                                  BQ518501 594 bp mRNA linear EST 10-JUN-200 EST625916 Generation of a set of potato cDNA clones for microarray analyses mixed potato tissues Solanum tuberosum cDNA clone STMJK54
Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Trachec Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; Asteridae; euasterids I; Solanales; Solanaceae; Solanum.
                                                             potato.
Solanum tuberosum
                                                                                                                         BQ518501
BQ518501.1
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For clone info: please contact Research Genetics, Libraries
Division tel 1-800-711-6195, email cdna@resgen.com
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119 c 121 g 155 t
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XhoI; supplier: Cornell University, Tanksley lab;
sequencing; The Institute for Genomic Research. I
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/lab_host="SOLR"
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/tissue_type="roots"
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/db_xref="taxon:4113"
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                                                                                                                           GI:21377370
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                                                                                                                                                                                                                                                     ATCCATCCCAATCCATCATACATTCGATGGTGGAAACACAGGATTCATCAGTATTGGCA
                                                                                                                                                                                                                                                                                                                           CTTGAAGTTATCGAAGCTCACTACCTTTTCGGAGCCGAGTATGACAACATTGAAATTGTC
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   sequence.
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AW775985.1
EST.
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Other_ESTs: EST625917
                                                                         EST335050
                                                                                             AW775985
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Email: potato@figr.org
This clone is available through the Research Genetics, contact the Research Genetics for further information 1-800-711-6195 or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Generation of a set of potato cDNA clones for microarray analyses
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Seq primer: T3
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Buell, C.R., Hart, A., Baker, B., Restrepo, S., Griffiths, H., van
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Medical Center Dr, Rockville,
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microarray analyses mixed potato tissues"
/tissue_type="mixed tissues"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /cultivar="Kennebec or Binjte"
/db_xref="taxon:4113"
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                    GI:7765798
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der Hoeven,R., Tsai,J. and
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                                                                       clone pDSIL-3N15,
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les 279; Conser
                                                                                                                                                                                                                                    CGGCCATCGTGGGCGCGCGGGCCTGCCGGGCGGGATGCGGGCGCTGAAGCACGGCCGCA 352
                                                                                         CCCAGGAGAACGGCGCCACGATCCTGCCGGGTGGACCAGCAGCACTCCGCGGTCTTTCAGG
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                                    CGCTGGCGGGCGAGGACACGGCCTGCGTCGAGCGCGTCATCATCACGGCGTCCGGCGGGC
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 GTATCCAGGGGTTAACAGAGGGTGCACTTAGGCGAGTCATTCTAACTGCATCCGGAGGTG
                                                                       CCCGGAAGCATAATGTAAAAATACTTCCTGCTGATTCCGAACATTCTGCTATTTTTCAGT
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Mismatches

286; Indels

0;

Gaps

0

532

472

358

412 238

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Department of Plant Pathology
University of Minnesota
495 Borlaug Hall, 1991 Upper Buford Circle,
Tel: 612 625 1243
Fax: 651 649 5058
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TIGR sequence name:MTFAK80TK
More information is available at.
http://chrysie.tamu.edu/medicago
Seq primer: SKmod (CTA 9AA CTA 9tg
Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Email: debbys@puccini.crl.umn.edu
Minnesota sequence name:M259318e
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ESTs from leaves of Medicago truncatula after inoculation with Colletotrichum trifolii
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Unpublished (2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Fedorova, M., Pierson, B.L.,
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                                                                                                        /note="Vector: pBluescript SK-; Site_1: EcoRI; Site_2: XhOI; CONA was prepared from polyA+ enriched RNA from cotyledons and primary leaves harvested.5 and 8 days after inoculation with Colletotrichum trifolii. The cDNA was directionally ligated into the Uni-ZAP XR vector from Stratagene and packaged using Gigapack III Gold packaging extracts. Plasmids containing cDNA inserts were excised from the recombinant lambda-ZAP phage using Ex-Assist helper phage and propagated in XLOLR cells. Note: EST may be of fungal origin."
                                                                                                                                                                                                                                                                                                                                                                                                                    /dev_stage="cotyledons and primary leaves harvested 5 8 days after inoculation with Colletotrichum trifolii" /lab_host="E. coli strain XLOLR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /tissue_type="leaves infected with Colletotrichum
trifolii"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /cultivar="genotype A
/db_xref="taxon:3880"
/clone="pDSIL-3N15"
/clone_lib="DSIL"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /organism="Medicago truncatula"
/cultivar="genotype A17"
  9.1%;
Score 107.4; DB 1
Pred. No. 5.5e-10;
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Bowman, C.L.,
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Craven,M.B., Hansen,T.S.,
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BG588663
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                                                                                                                                                                                                                                                                                                                                   Email: mjharrison@noble.org
The Samuel Roberts Noble Foundation: N387414e TIGR sequence name:
MTHBC69TK More information is available at: http://www.medicago.org
Seq primer: SKmod (CTA gAA CTA gtg gAT CC).
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Of Samuel Roberts Noble Foundation
Of Samuel Roberts Noble Foundation
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Fraser, C.M.
                                                                                                                                                                                                                                                                                                                                                                                                580-223-5810
580-221-7380
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       from phosphate-starved
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                             Unizap XR vector from Stratagene and packaged using Gigapack III Gold packaging extracts. Plasmids containing cDNA inserts were excised from the recombinant lambda-Zap
                                                                           twice weekly with 1/2 Hoaglands solutions containing 20um potassium phosphate. cDNA was prepared from polyA+enriched RNA. The cDNA was directionally ligated into the
   phage using Ex-assist
XLOLR cells."
                                                                                                                     /note="Vector: pBluescript SK-; Site_1: EcoRI; Site_2: XhOI; At the trifoliate stage, M. truncatula plants were transplanted to phosphate-free sand and grown for a further 30 days. During this period, they were fertilized
                                                                                                                                                                                    /dev_stage="phosphate-starved"
/lab_host="xLOLR"
                                                                                                                                                                                                                /tissue_type="roots"
                                                                                                                                                                                                                                 /clone_lib="MHRP-"
                                                                                                                                                                                                                                               /db_xref="taxon:3880"
/clone="pMHRP~57K17"
                                                                                                                                                                                                                                                                             /cultivar="A17"
                                                                                                                                                                                                                                                                                          /organism="Medicago truncatula"
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pMHRP-57K17, mRNA
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Anderson,O.A., Appels,R., Bailey,P., Blake,T., Close,T., S., Dubcovsky,J., Feuillet,C., Gale,M., Graner,A., Gust. Herrmann,R.G., Holton,T., Jacquemin,J.M., Jia,J., Joudri
                                                                                          Triticum aestivum 
Eukaryota; Viridiplantae;
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48.4%;
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                                                                                                                 BG586951 712 bp mRNA linear EST 11-
EST488720 MHAM Medicago truncatula/Glomus versiforme mixed
library cDNA clone pMHAM-47E16 5' end, mRNA sequence.
                                                                                                       library cDNA
BG586951
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 Harrison, M.J.,
               Eukaryota; mixed EST libraries.
1 (bases 1 to 712)
                                           Medicago truncatula/Glomus versiforme mixed Medicago truncatula/Glomus versiforme mixed
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International Triticeae EST Cooperative
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/dev_stage="fully developed after
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/clone_lib="ITEC JJL Wheat Leaf Library"
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434 TCCTGCCGGTGGACAGCGAGCACTCCGCGGTCTTTCAGGCGCTGGCGGGGGAGACACGG 493
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Unpublished (2001)
Contact: Harrison M.J.
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The Samuel Roberts Noble
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/db_xref-"taxon:119092"
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1000	21-OCT-1999:	W09953071-A1. 21-OCT-1999:	Key Location/Qualifiers 1.1182 /*tag= a /note= "no stop codon W09953071-A1. 21-OCT-1999:	Rhodobacter sphaeroides. Key Location/Qualifiers 1.1182 /*tag= a /note= "no stop codon given" W09953071-A1. 21-OCT-1999.	Isoprenoid; microorganism; detection; antibacteria heart disease; osteoporosis; haemostasis; cancer; health food; antifouling coating; farnesyl.pyrolin 1-deoxy-D-xylulose-5-phosphate; glycerylaldehyde-3 2-C-methyl-D-erythreitol-4-phosphate; ss. Rhodobacter sphaeroides. Key Location/Qualifiers CDS /*tag= a /note= "no stop codon given" W09953071-A1.	Rhodobacter sphaeroides nucleotide sequence SEQ ID Isoprenoid; microorganism; detection; antibacteria heart disease; osteoporosis; haemostasis; cancer; health food; antifouling coating; farnesyl pyrolin 1-deoxy_D-xylulose-5-phosphate; glycerylaidehyde-3 2-C-methyl-D-erythreitol-4-phosphate; ss. Rhodobacter sphaeroides. 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Key I. 1182 /*tag= a /note= "no stop codon given" W09953071-A1.	10.3 14.4 21 AAA50082 40 116.8 9.9 1847 21 AAA50082 41 116 9.8 1197 24 AAL40189 42 116 9.8 11204 22 AAS46245 43 114.8 9.7 2735.4 21 AAC81914 44 114.8 9.7 1230025 20 AAX91990 45 114.4 9.7 1714 21 AAC40082 ALIGNMENTS SULT 1 Z33164 AAZ33164; 26-JAN-2000 (first entry) Rhodobacter sphaeroides nucleotide sequence SEQ ID NO: Rhodobacter sphaeroides nucleoting farnesy prolinic a 1-deoxy-D-xylulose-5-phosphate; glycerylaidehyde-3-pho 2-C-methyl-D-erythreitol-4-phosphate; ss. Rhodobacter sphaeroides 1.1182 CDS Location/Qualifiers CDS /*tag- a /note- "no stop codon given" W09953071-A1.	36 124.8 10.6 738 22 AAP71560 37 124.4 10.5 1434 21 AAA50100 38 123.6 10.5 1732 22 AAP54883 39 122 10.3 1434 21 AAA50082 40 116.8 9.9 1847 21 AAA47410 41 116 9.8 11204 22 AAS46245 43 114.8 9.7 1233025 20 AAX91990 45 114.4 9.7 1714 21 AAC40082 AAZ33164 standard; DNA; 1182 BP. AAZ33164; 26-JAN-2000 (first entry) Rhodobacter sphaeroides nucleotide sequence SEQ ID NO:	32 125.2 10.6 1221 21 AAC81871 33 125.2 10.6 1384 24 AAL40193 34 125.2 10.6 1384 24 AAL40193 35 125.2 10.6 1732 22 AAF54886 36 124.4 10.5 1434 21 AAA50100 37 124.4 10.5 1434 21 AAA50100 38 123.6 10.5 1732 22 AAF54883 39 122 10.3 1434 21 AAA50100 40 116.8 9.9 1847 21 AAA47410 41 116.9 9.1 1197 24 AAL40189 42 116 9.8 1197 24 AAL40189 43 114.8 9.7 1230025 20 AAX91990 45 114.4 9.7 1714 21 AAC40082 BALIGNMENTS SULT 1 233164 AAZ33164; 26-JAN-2000 (first entry) AAZ33164; 26-JAN-2000 (first entry) Rhodobacter sphaeroides nucleotide sequence SEQ ID NO: Isoprenoid; microorganism; detection; antibacterial; heart disease; osteoporosis; haemostasis; cancer; immu health food; antifoulling coating; farnesyl pyrolinic a 1-deoxy-D-xylulose-5-phosphate; glycerylaidehyde-3-pho 2-C-methyl-D-erythreitol-4-phosphate; ss. Rhodobacter sphaeroides. Key Location/Qualifiers CDS /*tag- a/note-"no stop codon given" W09953071-A1.	29 130.6 11.2 1701 21 ARAY (17) 29 130.6 11.0 1733 24 ABQ70612 30 127.4 10.8 495269 24 ABQ67195 31 126.8 10.7 1197 21 AAAC81871 32 125.2 10.6 1289 21 AAC81871 33 125.2 10.6 1384 24 AAL40193 35 125.2 10.6 1384 22 AAF54886 36 124.8 10.6 738 22 AAF54886 36 124.8 10.5 1732 22 AAF54886 37 124.4 10.5 1434 21 AAA50100 38 123.6 10.5 1732 22 AAF54883 39 122 10.3 1434 21 AAA50100 40 116.8 9.9 1847 21 AAA64019 41 114.8 9.7 273254 21 AAC81914 44 114.8 9.7 1230025 20 AAX91990 45 114.4 9.7 1714 21 AAAC4082 SUUT 1 233164; AAZ33164 standard; DNA; 1182 BP. AAZ33164; AAZ33164; 26-JAN-2000 (first entry) Rhodobacter sphaeroides nucleotide sequence SEQ ID NO: Isoprenoid; microorganism; detection; antibacterial; heart disease; osteoporosis; haemostasis; cancer; immuhealth food; antifoulling coating; farnesyl pyrolinic a 1-deoxy-D-xylulose-5-phosphate; glycerylaidehyde-3-phocense of the properties of	26 145.8 12.3 349980 22 AAH68031 27 135.6 11.5 7415 20 AAX20504 28 132.8 11.2 1901 21 AAA747405 29 130.6 11.0 1733 24 ABQ770612 30 127.4 10.8 495269 24 ABQ57195 31 126.8 10.7 1197 21 AAA52152 32 125.2 10.6 1281 21 AAC81871 33 125.2 10.6 1281 21 AAC81871 34 125.2 10.6 1384 24 AAL40193 35 125.2 10.6 1384 22 AAF54886 36 124.8 10.6 738 22 AAF54886 37 124.4 10.5 1434 21 AAA50100 38 123.6 10.5 1732 22 AAF54883 39 122 10.3 1434 21 AAA50082 40 116.8 9.9 1197 24 AAL40189 41 114.8 9.7 123025 20 AAX91990 45 114.4 9.7 1714 21 AAC40082 46 114.8 9.7 173025 20 AAX91990 47 114.4 9.7 1714 21 AAC40082 48 114.4 9.7 1714 21 AAC40082 49 114.4 9.7 1714 21 AAC40082 40 116.8 9.8 1197 24 AAS4524 41 114.8 9.7 173025 20 AAX91990 45 114.4 9.7 1714 21 AAC40082 48 114.4 9.7 1714 21 AAC40082 48 114.4 9.7 1714 21 AAC40082 49 114.4 9.7 1714 21 AAC40082 40 116.8 9.8 1197 22 AAS46524 40 116.8 9.7 123025 20 AAX91990 45 114.4 9.7 1714 21 AAC40082 40 116.8 9.7 1714 21 AAC40082 41 116.9 9.7 1714 21 AAC40082 42 116 9.8 11204 22 AAS46524 43 114.8 9.7 173025 20 AAX91990 45 114.4 9.7 1714 21 AAC40082 46 116.9 9.7 1714 21 AAC40082 47 116.9 9.7 1714 21 AAC40082 48 116.9 9.7 1714 21 AAC40082 49 116.9 9.7 1714 21 AAC40082 40 116.8 9.7 1714 21 AAC40082 40 116.8 9.7 173025 20 AAX91990 41 116.9 9.7 1714 21 AAC40082 41 116.9 9.7 1714 21 AAC40082 41 116.9 9.7 1714 21 AAC40082 41 116.9 9.7 1714 21 AAC40082 42 116.9 9.7 1714 21 AAC40082 43 114.4 9.7 1714 21 AAC40082 44 114.4 9.7 1714 21 AAC40082 45 114.4 19.7 1714 21 AAC40082 46 116.9 9.7 1714 21 AAC40082 47 1714 21 AAC40082 48 116.9 9.7 1714 21 AAC40082 49 116.9 9.7 1714 21 AAC40082 40 116.8 9.7 1714 21 AAC40082 40 116.8 9.7 1714 21 AAC40082 40 116.8 9.7 1714 21 AAC40082 41 118.9 9.7 1714 21 AAC40082 41 118.0 9.7 1714 21 AAC40082 41 118.0 9.7 1714 21 AAC40082 41 118.0 9.7 1714 21 AAC40082 41 118.0 9.7 1714 21 AAC40082 41 118.0 9.7 1714 21 AAC40082 41 118.0 9.7 1714 21 AAC40082 41 118.0 9.7 1714 21 AAC40082 41 118.0 9.7 1714 21 AAC40082 41 118.0 9.7 1714 21 AAC40082 41 118.0 9.7 1714 21 AAC40082 41 118.0 9.7 1714	22 179, 2 15, 2 1115 24 ABK73792 23 172, 4 14.6 1209 24 AALA0190 24 145.8 12.3 349980 22 AAH68530 26 145.8 12.3 349980 22 AAH68531 27 135.6 11.5 7415 20 AAX20504 28 132.8 11.2 1901 21 AAAA7405 29 130.6 11.0 1733 24 ABQ70612 30 127.4 10.8 495269 24 ABQ70612 30 127.4 10.8 495269 24 ABQ70612 31 126.8 10.7 1197 21 AAA52152 31 125.2 10.6 1289 21 AAA52152 31 125.2 10.6 1289 21 AAA52152 32 125.2 10.6 1289 21 AAA50100 37 124.4 10.5 1434 21 AAA50100 38 123.6 10.5 1732 22 AAF5488 36 124.8 10.5 738 22 AAF5488 36 124.8 10.5 738 22 AAF5488 37 124.4 10.5 1434 21 AAA50100 38 123.6 10.3 1343 21 AAA50100 38 123.6 10.3 1434 21 AAA50100 38 123.6 10.5 1732 22 AAF5488 30 124.8 10.5 738 22 AAF5488 31 14.8 9.7 1732 22 AAA547410 41 116.9 8 1197 24 AAA40189 42 116.9 9.7 1230025 20 AAX91990 45 114.4 9.7 1734 21 AAA640082 AAA233164; 26-JAN-2000 (first entry) Rhodobacter sphaeroides nucleotide sequence SEQ ID NO: Isoprenoid; microorganism; detection; antibacterial; heart disease; osteoporosis; haemostasis; cancer; immu health food; antifouling coating; farnesyl pyrolinic a 1-deoxy-D-xylluose-5-phosphate; glycerylaidehyde-3-pho 2-C-methyl-D-erythreitol-4-phosphate; ss. Key Location/Qualifiers /*tag-a /*note="no stop codon given" W09953071-A1. 21-OCT-1999:	1/2 204 1/.3 88 21 AAX23882 18 201 81.8 15.4 35829 23 AAS59573 20 181.8 15.4 35829 23 AAS59573 21 181 15.3 1118 24 AAL40186 21 179.2 15.2 1115 24 ARA73192 23 177.4 14.6 1209 24 AAL40191 24 145.8 12.3 349980 22 AAH68330 25 145.8 12.3 349980 22 AAH68331 27 135.6 11.5 7415 20 AAX20504 28 132.8 11.2 349980 22 AAH68331 27 135.6 11.5 7415 20 AAX20504 28 132.8 11.2 1901 21 AAA47405 29 130.6 11.0 1733 24 ABC7195 31 126.8 10.7 1197 21 AAA57150 31 125.2 10.6 1289 21 AAC81871 33 125.2 10.6 1289 21 AAC81871 33 125.2 10.6 1289 21 AAC81871 33 125.2 10.6 1289 21 AAA50100 36 124.8 10.5 1732 22 AAF54886 36 124.8 10.5 1732 22 AAF54886 37 124.4 10.5 1434 21 AAA50100 38 123.6 10.5 1732 22 AAF54886 39 122 AAA50100 31 12.6 9.9 1847 21 AAA510100 31 12.6 9.9 1847 21 AAA50100 41 11.6 9.8 11204 22 AAF548644 43 114.8 9.7 1230025 20 AAX91990 45 114.4 9.7 1714 21 AAA60082 45 114.4 9.7 1714 21 AAA60082 46 114.4 9.7 1714 21 AAC40082 47 116.5 144 22 AAS64644 48 114.4 9.7 1714 21 AAC40082 48 114.4 9.7 1714 21 AAC40082 49 114.4 9.7 1714 21 AAC40082 40 115.5 144 9.7 1714 21 AAC40082 41 114.8 9.7 1230025 20 AAX91990 45 114.4 9.7 1714 21 AAC40082 45 114.4 9.7 1714 21 AAC40082 46 114.5 9.7 1714 21 AAC40082 47 1714 21 AAC40082 48 114.4 9.7 1714 21 AAC40082 49 116 9.8 11204 22 AAS656245 40 116.8 9.9 1847 21 AAC40082 40 116.9 9.8 11204 22 AAS656245 40 116.9 9.8 11204 22 AAS656245 40 116.9 9.8 11204 22 AAS656245 41 14.4 9.7 1714 21 AAC40082 41 16.9 9.8 11204 22 AAS66245 42 116 9.8 11204 22 AAS66245 43 114.5 9.7 1230025 20 AAX91990 45 114.4 9.7 1714 21 AAC40082 41 114.8 9.7 1230025 20 AAX91990 45 114.4 9.7 1714 21 AAC40082 41 114.8 9.7 1230025 20 AAX91990 45 114.4 9.7 1714 21 AAC40082 41 114.8 9.7 1230025 20 AAX91990 45 114.4 9.7 1714 21 AAC40082 41 114.8 9.7 1230025 20 AAX91990 45 114.4 9.7 1714 21 AAC40082 41 114.8 9.7 1230025 20 AAX91990 45 114.4 9.7 1714 21 AAC40082 41 116.9 9.8 11204 22 AAS66245 41 116.9 9.8 11204 22 AAS66245 41 116.9 9.8 11204 22 AAS66245 41 116.9 9.8 11204 22 AAS66245 41 120 120 120 120 120 120 120 120 120 12

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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CC pyrolinic producing enzyme. The method of preparation of an isoprenoid compound comprises using at least 1 DNA, a vector, cloned cells, their derived recombinant DNAs or transformed products in a culture system and comprise recombinant DNAs or transformed products in a culture system and compound recombinant DNAs or transformed products in a culture system and compound for activating or catalysing the least 1 of the following; (a) a compound for activating or catalysing compounds are compound for activating or catalysing compounds; (b) an enzyme producing farnesyl pyrolinic compounds; (c) a protein which elevates the efficiency of synthesis of compounds; and compounds as of 4 amino acid sequence compounds; and compounds are useful; (d) a protein compound or an additional amino acid being inserted; (d) a protein compound or activates or catalyses the production of 2-C-methyl-D-erythreitol. The DNA encoded in (a)-(e). Isoprenoid compounds are useful in drugs (e.g. for the treatment of heart diseases, osteoporosis and hemostatis, compound compounds are useful in drugs compounds. The isoprenoid salso inhibit enzymatic reactions on the non-mevalonate pathway and can be used as antibacterials and compound compounds. The present sequence is used in the exemplification of compounds.
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Takahashi
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                                  CTCGCCAACAAGGAAAGCCTCGTGACGGCAGGGCAACTCCTGATGCGGACGGCCCAGGAG
                                                                 GTGGGCGCCGCGGCCTCGTGCCCGGAATGCGGGCGCTGAAGCACGGCCGCACGCTGGCG
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   describes the preparation of an isoprenoid sing at least 1 DNA e.g. encoding proteins which
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; 408 C; 417 G; 172 T; 0 other;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 1182; DB 20; Length 1182; Pred. No. 1.7e-187;
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AL40184 standard; DNA; 1161 BP. AL40184; 3-SEP-2002 (first entry) soprenoid related nucleic acid sequence SEQ ID No 96. soprenoid; CoQ(10); 1-deoxyxylulose-5-phosphate synthase; DXS; DDS; ecaprenyl diphosphate synthase; ds. phingomonas trueperi. 0200226933-A2.		ACGGCGCCACGATCCTGCCGGTGGACAGCGAGCACTCCGCGGTCTTTCAGGCGCTGG

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Matches
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               The invention relates to methods and materials for the production of isopremoids. More particularly the invention provides isolated nucleic acids, substantially pure polypeptides, host cells, and methods for producing various isopremoid compounds. The polypeptides are useful for the production of isopremoids, especially CoQ(10). Expressing the pure polypeptides, which has 1-deoxyxyluloses-5-phosphate synthase (DXS) activity or decapremyl diphosphate synthase (DDS) activity, is useful for increasing production of CoQ(10) in a cell having endogenous DDS activity. This polypucleotide represents a nucleic acid sequence relative to the isopremoid production of the invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Substantially pure polypeptides having e.g., 1-deoxyxylulose-5-phosphate synthase activity, production of isoprenoids, especially CoQ(10)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Claim 48;
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                                                                                                                        GACTGGCCGAAATGGCGCGTGCGCTGAAGGCGGAGCTTGCCGTCACCGCGCATGAGGACT
                 GCCTCGAGCGCATCCGCGCCTGCACCGTGGCCGAGGCGCAGGCCCATCCCAACTGGTCCA
                                                                  ACACGGCCTGCGTCGAGCGCGTCATCATCACGGCGTCCGGCGGGCCGGTTCCGCGACTGGA
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649; Conserv
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Pred. No. 1.1e-54;
0; Mismatches 421
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                                                                          Substantially pure polypeptides having e.g., 1-deoxyxylulose-5-phosphate synthase activity, production of isoprenoids, especially COQ(10)
                                                                                                                  WPI;
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                                                         Claim
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                                                                                                                                     Gokarn
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                                                                                                                                                                                                                                                                                                                                                                                                                              TTCTCAATGCCGCCAACGAAGTCGCCGTCGCGGCCTTTCTCGCCGGGCGGATCGGATTCC 1024
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                                                        Fig
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                                                                                                                                                                                                                                                                          CoQ(10); 1-deoxyxylulose-5-phosphate synthase;
diphosphate synthase; ds.
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                                                                                                                                                                                              2001WO-US30328
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The invention relates to methods and materials for the production of isoprenoids. More particularly the invention provides isolated nucle acids, substantially pure polypeptides, host cells, and methods for producing various isoprenoid compounds. The polypeptides are useful the production of isoprenoids, especially CoQ(10). Expressing the pure polypeptides are useful the production of isoprenoids, especially CoQ(10).

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CCGACATGCGCCACGCCATCGGGATTCGCGCTGAACTGGCCGGGTCGCGGGGAGGTGCCCG
                                                                                                                                                       CCATCGTCCATGCGATGGTGGGCTTCTGCGACGGGGCCCTGATGGCCCATCTCGGCCCCG
                                                                                                                                                                                                                                                                                                                                                                                 ACACGGCCTGCGTCGAGCGCGTCATCATCACGGCGTCCCGGGGGGGCCGTTCCGGGACTGGA 547
                                                                                                                                                                                                                                                                                                                                                                                                                                       GACTGGCCGAAATGGCGCGTGCGCTGAAGGCGGAGCTTGCCGTCACCGCGCATGAGGACT
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                                           TCGCCCGGATCGACCTCGCACAGATTGCGAGCCTCACCTTCCAGAAGCCTGACGAGGAAC
                                                                                                                                         CCGTCGTCCATTCGATGGTGGAATATGTCGACGGATCGGTGCTGGCCCAGCTCGGCACGC
                                                                                                                                                                                                AAGCCTTCCACCTGTTCCCCGGTCGCCGACCAACTGGCCGTGCTGGTCCATCGCCAAT
                                                                                                                                                                                                                          AGACGCGCGAATTCTTCGGCTTCGAGCCGGACCGGATCGAGGCGGTCGTCCATCCGCAAT
                                                                                                                                                                                                                                                                       TGGGCCAGCGGATCTCCATCGACAGCGCCTCGATGTTCAACAAGGCGCTCGAGCTGATCG
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                           GCCCGCCGCTCGACCTTGCCACGGTGGGTAAGCTCGAGTTCGAAAATCCCGATCTCGATC
                                                                                  CCGACATGCGCACGCCGATCGCCTATGCGCTGGCTTGGCCCGGAGCGGATGGAGACGCTGT
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649; Conser
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Pred. No. 1e-5
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137

AAATGGCGCGTGCGCTGAAGGCGGAGCTTGCCGTCACCGCGCATGAGGACTGCCCTGCCCCG

GTTACGAAGCCTTCGCCCTGACTGGCCTTCAGCCGCCTGGCCGAACTCGAGGCGCTGTGCC GGCCCGAGGCGTTCCGCACCGTCGCTCTGACCGGCGGCGCGCAACATCCGGCGACTGGCCG

148 136

196

TCGGCGCGACCGGCTCGATCGGCCTGAGCACCCTGGACGTCGTCCAGCGTCATCCCGATC TTGGGGCCACCGGCTCCATCGGCGAATCCACCTTCGACCTCGTCATGCGGAAGGGCG---

88

89 77 29 20

Query Match Best Local Matches

Similarity

24.2%; 55.8%;

Conservative

0;

Score 286; DB 24; Pred. No. 4.7e-39; 0; Mismatches 455,

455;

18;

Gaps

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76

Length Indels

Sequence

1191 BP; 176 A; 400 C; 413 G; 202 T; 0 other;

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RESULT 4
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                    isoprenoids. More particularly the invention provides isolated nucleic acids, substantially pure polypeptides, host cells, and methods for producing various isoprenoid compounds. The polypeptides are useful for the production of isoprenoids, especially CoQ(10). Expressing the pure polypeptides, which has I-deoxyxylulose-5-phosphate synthase (DXS) activity or decaprenyl diphosphate synthase (DDS) activity, is useful for increasing production of CoQ(10) in a cell having endogenous DDS activity. This polynucleotide represents a nucleic acid sequence relative to the isoprenoid production of the invention.
                                                                                                                                                                                              Substantially pure polypeptides having e.g., 1-deoxyxylulose-5-phosphate synthase activity, production of isoprenoids, especially CoQ(10)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AAL40185;
                                                                                                                                             The invention relates to methods and materials for the production
                                                                                                                                                                       Disclosure; Fig 31; 246pp; English.
                                                                                                                                                                                                                                                    WPI; 2002-416480/44
                                                                                                                                                                                                                                                                                                                                  29-SEP-2000;
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                                                                                                                                                                                                                                                                                                                                                                                                               WO200226933-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 decaprenyl
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Isoprenoid related nucleic acid
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RESULT 5
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                                                                                                                                                                               CGGCCATGCTGAATGCCGCGAACGAGGTGGCCGTGGCCGCATTTCTCGAGCGGCACATCC
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The invention relates to methods and materials for the production of isoprenoids. More particularly the invention provides isolated nucleic acids, substantially pure polypeptides, host cells, and methods for producing various isoprenoid compounds. The polypeptides are useful for the production of isoprenoids, especially CoQ(10). Expressing the pure polypeptides, which has 1-deoxyxylulose-5-phosphate synthase (DXS) activity or decaprenyl diphosphate synthase (DXS) activity, is useful for increasing production of CoQ(10) in a cell having endogenous DDS activity. This polynucleotide represents a nucleic acid sequence relating to the isoprenoid production of the invention.
                                                                                                                                                                                                                                    substantially pure polypeptides having e.g., 1-deoxyxylulose-5-phosphate synthase activity, production of isoprenoids, especially COQ(10)
                                                                                                                                                                                                                                                                                                        WPI;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  04-APR-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Isoprenoid; CoQ(10); 1-deoxyxylulose-5-phosphate
decaprenyl diphosphate synthase; ds.
 Sequence 1161 BP;
                                                                                                                                                                                                        Disclosure; Fig 31; 246pp; English.
                                                                                                                                                                                                                                                                                                                                     Gokarn
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Streptomyces
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               WO200226933-A2
                                                                                                                                                                                                                                                                                                        2002-416480/44.
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                                                                                                                                                                                                                                                                                                                                    Jessen H,
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151 A; 399 C; 449 G; 162 T; 0 other;
                                                                                                                                                                                                                                                                                                                                       Zidwick
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O Sequence 1161 BP; 151 A; 399 C; 449 G; 162 T; 0 other;
Ouery Match
20.9%; Score 247.2; DB 24; Length 1161;
Best Local Similarity 56.9%; Pred. No. 1.3e-32;
Matches 474; Conservative 0; Mismatches 353; Indels 6; Gaps

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Ş QΥ 밁 δõ 밁 δÃ д Ş Вþ δÃ 맑 Š Вр Ş ₽ 651 588 591 528 531 468 471 414 411 354 291 234 231 GGTCGCCGGCGGCGCGACGCCGACCGGCCGACCGGCCGACTGGACCAT 351 294 GCCCTCGAGCTGATCGAGCCGCGAATTCTTCGGCTTCGAGCCGGACCGGATCGAGCC GCCGTTCCGCGACTGGAGCCTCGAGCGCATCCGCGCCTGCACCGTGGCCGAGGCGCAGGC CACGCTGGCGCTCGCCAACAAGGAAAGCCTCGTGACGGCAGGGCAACTCCTGATGCGGAC GCACCCGACCTGGGCGATGGGCCCGGTGGTGACGATCAACTCGGCGACCCTGGTGAACAA CCATCCCAACTGGTCCATGGGCCAGCGGATCTCCATCGACAGCGCCTCGATGTTCAACAA GGCGCTGGCCGGCGCGCGCGCGGAGGTCCGCAAGCTGGTGACCGCCAGCGGCGG GGCGCTGGCGGGCGAGGACACGGCCTGCGTCGAGCGCGTCATCATCACGGCGTCCGGCGG GGCGCAGCC----GGCCCAGGAGAACGGCGCCACGATCCTGCCGGTGGACAGCGAGCACTCCGCGGTCTTTCA GGTGCTGGTGCTGGCGAACAAGGAGTCGCTGATCGTCGGCGGTCCGCTGGTGAAGGCCGGT GTCGGCCATCGTGGCGCCGCGGGCCTCGTGCCCGGAATGCGGGCGCTGAAGCACGGCCG GGTGCTGGCGGGCCCGGACGCGGCGACCGAGCTGGCCGCGGAGTGCCACTCGGTGCT -CGGCCAGATCGTGCCGGTGGACTCCGAGCACGCCCCGCGCTGTTCCA 470 530, 650 467 413 410 527 290 710 587 590 350 293

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The present invention describes methods of obtaining immunogenic proteins from Neisseria genomic sequences. AAA81453 to AAA82414 represent specifically claimed Neisseria meningitidis genomic DNA sequences; AAA81260 to AAA81303 and AAB256520 to AAB2563 represent Neisseria DNA sequences and their corresponding proteins; AAA81254 AAA81259 and AAA81304 to AAA81321 represent PCR primers used in the isolation of Neisseria meningitidis DNA sequences; and AAA81322 to
                                                                                                                                    Isolated nucleotide sequences of Neisseria meningitidis which used in the diagnosis and treatment of N. meningitidis infectiother Neisserial infections, for example, N.gonorrhoea -
                                                                                                              Claim 7;
                                                                                                                                                                                             WPI;
                                                                                                                                                                                                                                  Frazer CM, I
Masignani V,
                                                                                                                                                                                                                                                                                                    09-OCT-1998;
30-APR-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Neisseria meningitidis; Neisseria gonorrheae; genome; i antigen; vaccine; diagnosis; infection; antibacterial;
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                                                                                                                                                                                                                       Rappuoli R,
                                                                                                                                                                                                                                                                           (CHIR ) CHIRON CORP.
                                                                                                                                                                                                                                                                                                                                           08-OCT-1999;
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                                                                                                              Page 532-547;
                                                                                                                                                                                                                                                                                                                                                                                                                          meningitidis
                                                                                                                                                                                                                                                Hickey
                                                                                                                                                                                                                       Pizza M;
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99US-0132068.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              composition can be used as a medicament (or in the manufacture of a medicament) for treating, preventing or diagnosing infection due to Neisserial bacteria. For example, some of the identified proteins could be components of vaccines against Meningococcus B; against all serotypes and/or against all pathogenic Neissariae. Identification of sequences from the bacterium will also facilitate production of biological probes, particularly organism-specific probes. Attempts to make efficacious Meningococcus B vaccines have failed mainly due to antigen tolerance. Multivalent vaccines have also been tried but none have successfully overcome antigenic variability. The provision of further, complete sequences may provide an opportunity to identify secreted or surface exposed proteins that may be presumed targets for the immune system and which are not antigenically variable or at least more conserved than
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   invention. The nucleic acid sequences, protein sequences, and antibodies against them, can be used in the manufacture of a composition. The
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAA81452 represent Neisseria meningitidis MenB polynucleotide sequences, which are all used in the exemplification of the princention. The nucleic acid sequences, protein sequences, and
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                                                            TCTGGCAAACAAAGAAACGCTGGTGGTTTCCGGCGCGCTTGTTTATGGAAACCGCCCGTGC
                                                                                                  GCTCGCCAACAAGGAAAGCCTCGTGACGGCAGGGCAACTCCTGATGCGGACGGCCCAGGA 419
                                                                                                                                                                   CGTGGGCGCGCGGGCCTCGTGCCCGGAATGCGGGGCGCTGAAGCACGGCCGCACGCTGGC
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The present invention describes the full length genome of Neisseria meningitidis B (NMB). The sequences in AAF21544 and AAF21607 to AAF21613 represent fragments of the NMB genomic sequence, as the sequence was too long to go in a record on its own it was split into 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Neisseria meningitidis; Neisseria gonorrheae; diagnosis; antigen; detection; infection; gen
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C, Mora M,
V, Grandi G;
                                                                                                                                                     Appendix A; 692pp; English.
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isoprenoids. More particularly the invention provides isolated nucle acids, substantially pure polypeptides, host cells, and methods for producting various isoprenoid compounds. The polypeptides are useful the production of isoprenoids, especially CoQ(10). Expressing the purpolypeptides, which has 1-deoxyxylulose-5-phosphate synthase (DXS) activity or decaprenyl diphosphate synthase (DDS) activity, is useful increasing production of CoQ(10) in a cell having endogenous DDS activity. This polynucleotide represents a nucleic acid sequence released.
                                                                                                                                                                                                                                         Substantially pure polypeptides having e.g., 1-deoxyxylulose-5-phosphate synthase activity, production of isoprenoids, especially CoQ(10)
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nitrites in methane-containing environments such as landfills, waste water treatment systems or anywhere that methane oxygen and nitrates present. The bacterial strain of the invention can be used as a denitrifying agent for the conversion of nitrate or nitrite to nitrous oxide with methane or methanol as a carbon source. It is also used in production of biomass including proteins, carbohydrates and a wide variety of pigments (particularly for isoprenoid pigments for the purpose of generating animal feeds), in production of terpenoid and carotenoid compounds, useful as pigments and as monomers in polymeric materials and in production of exopolysacharides at high levels. Sequences ABK83230-ABK83270 represent high growth methanotronhic bacterial strain num of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WPI;
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                                                                                                                                                                                                                                                         RNA. The bacterial strain is useful for the production of single cell protein and for the biotransformation of a nitrogen-containing compounce. g. ammonia, nitrate, nitrite or nitrogen. It is also useful for the
                                                                                                                                                                                                                                                                                                                 which grows on a C1 carbon substrate e.g. methane and methanol, and comprises a functional Embden-Meyerhof carbon flux pathway comprising a gene coding a pyrophosphate dependent phosphofrutokinase enzyme or a 16s
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thanol; Embden-Meyerhof carbon flux pathway;
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                                                                                                                                                                                                                                                                                                                                                                                                                                              The invention relates to a method for producing carotenoid compounds. The method comprises a transformed metabolising host cell, comprising suitable levels of isopentenyl pyrophosphate and a nucleic acid molecule encoding an enzyme in the carotenoid biosynthetic pathway, under the control of regulatory sequences, and contacting the host cell with carbon substrate to produce a carotenoid compound. The method is useful for producing carotenoid compounds such as antheraxanthin and astaxanthin, by using microorganism having a nucleic acid molecule encoding enzymes in the carotenoid biosynthetic pathway and which metabolise single carbon substrates. The carotenoids have potent anti-oxidant properties useful in diet, and aquaculture elements. The carotenoids are also useful as in the synthesis of staroids flavours and flavours and flavours and the synthesis of staroids flavours and flavours and starons and approach the synthesis of staroids flavours and flavours and starons and approach the synthesis of staroids flavours and flavours and starons and approach the synthesis of staroids flavours and starons and approach the synthesis of staroids flavours and starons and approach the synthesis of staroids flavours and synthetic pathway and which metabolis are also useful as an approach the synthesis of staroids flavours and synthetic pathway and which metabolis are also useful as a synthesis of staroids flavours and synthesis of staroids flavours and synthesis of staroids flavours and synthesis of staroids are also useful as a synthesis of staroids flavours and synthesis of staroids synthesis of staroids are also useful as a synthesis of staroids and synthesis of staroids synthesis of synthesis of staroids synthesis of synthesis of synthesis of synthesis of synthesis of synthesis of synthesis of synthesis of synthesis of synthesis of synthesis of synthesis of synthesis of synthesis of synthesis of synthesis of synthesis of synthesis of synthesis of synthesis of synthesis of synthesis of synthesis of synthesis of synthesi
                                                                                                                                                                                                                                                                                                                                                                   intermediates in the synthesis of steroids flavours and fragrances and compounds for potential electro-optic applications. The present sequence is Methylomonas 16a spi D-1-deoxyxylulose-5-phosphate reductoisomerase (Dxr) enzyme gene used in the invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Producing carotenoid compounds e.g. antheraxanthin and astaxanthin, by using microorganisms having a nucleic acid molecule encoding enzymes in the carotenoid biosynthetic pathway and which metabolize single carbon
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Odom JM, Picataggio
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01-SEP-2000;
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                                      CTCCTGATGCGGACGGCCCAGGAGAACGGCGCCACGATCCTGCCGGTGGACAGCGAGCAC
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Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    encoding an isoprenoid compound biosynthetic enzyme, and for the microbial production of isoprenoid compounds. The molecules of the invention are also useful for regulating isoprenoid biosynthesis in an organism and for producing recombinant organisms for producing various isoprenoid compounds. The nucleic acid is also useful for feed additive, for the production of keratenoids and their derivatives, isoprenoid intermediates, and as pure products useful as pigments, flavours and fragrances. The present nucleic acid sequence encodes the Methylomonas 16a open reading frame 2 (ORF2) dxr (1-deoxyxylulose-5-phosphate reductoisomerase enzyme) protein of the invention, as described above.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence
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ATGGTGGACTATGTCGATGGTTTCGGTTTTGGCGCAGATGGGTAATCCCGACATGCGCACG
                           ATGGTGGGCTTCTGCGACGGGGGCCTGATGGCCCCATCTCTGGCCCCGCCGACATGCGCCAC
                                                       TTCGGCTTCGAGCCGGACCGGATCGAGGCGGTCGTCCATCCGCAATCCATCGTCCATGCG
                                                                                                                TCGGTCGATTCCGCCACCATGATGAACAAAGGTCTCGAACTGATCGAAGCCTGCTTGTTG
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01-SEP-2000;
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Unidentified
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2000US-229907P
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The present sequence is that of vector plasmid pTJS75:dxxS:dxx:Tn5Kn. This is a derivative of RKZ, a broad host-range plasmid, modified to include kanamycin resistance and 2 Methylomonas genes: dxs encoding 5'deoxy-D-xylulose synthase; and dxR encoding 5'deoxy-D-xylulose reductoisomerase. A Mentha spicata limonene synthase gene (see ABL53856) encoding a truncated enzyme (see ABB75749) was ligated into the vector, creating plasmid pDH3, in which the limonene synthase gene was flanked on the 5' end by dxS and on the 3' end by dxR. pDH3 was transferred to Methylomonas sp. 16a by triparental conjugal mating. Cells that received the limonene synthase were demonstrated to produce limonene. This is an example of the method of the invention, in which a Cl metabolising host cell is

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56.5%;
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Pred. No. 6.9e-29;
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 ACGGCCCAGGAGAACGGCGCCACGATCCTGCCGGTGGACAGCGAGCACTCCGCGGTCTTT
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Neisseria meningitidis; Neisseria antigenic; diagnosis; immunogenic, antibacterial; gene therapy; ds.
                                                                                    01-MAY-1998;
31-JUL-1998;
                                                                       02-SEP-1998
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                                                                                                                                                                                                                Neisseria meningitidis
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                                            09-OCT-1998
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98US-0103794.
98US-0103796.
99US-0121528.
                                         98US-0083758.
98US-0094869.
98US-0098994.
98US-0099062.
98US-0103749.
                                                                                                                               99WO-US09346
                                                                                                                                                                                                                                                        immunogenic;
                                                                                                                                                                                                                                                                                                    572 partial
                                                                                                                                                                                                                                                           gonorrheae;
; infection;
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(CHIR) CHIRON CORP.
INST GENOMIC

Fraser C, Petersen J Tettelin F Ä, Galeotti C, Grandi G, , Pizza M, Rappuoli R, JC; Hickey Ratti ຸ. ພັພ Masignani V, Scalato E, (Mora M; Scarselli M;

WPI; 2000-062150/05. P-PSDB; AAY75121.

vaccines Novel Neisserial polypeptides predicted and diagnostics б be useful antigens

Claim Page 879; 1453pp; English.

AAZ53015 to AAZ54536, AAZ54577 to AAZ54615, and AAY74253 to AAY75941 represent novel Neisseria meningitis and N. gonorrheae polynucleotides and polypeptides. AAZ54537 to AAZ54576 and AAZ54616 to AAZ55473 represent PCR primers used in the exemplification of the present invention. The polypeptides, the polynucleotides, antibodies and compositions of the invention can be used as vaccines, as diagnostic reagents, and as immunogenic compositions. The polypeptides can be used in the manufacture of medicaments for treating or preventing infection due to Neisserial bacteria (e.g. meningitis and septicaemia), to detect the presence of Neisseria bacteria, or to raise antibodies. They may also be used to the presence of Neisseria bacteria, or to raise antibodies. They may also be used to the presence of Neisseria bacteria, or to raise antibodies. They may also be used to the presence of Neisseria bacteria, or to raise antibodies. be used to screen for agonists or antagonists, which may themselves have use as antibacterial agents. The polynucleotides of the invent may also be used in gene therapy protocols.

Sequence 888 B₽; 186 A; 280 C; 242 G; 180 T; 0 other;

Local ATGTCGGCCATCGTGGGCGCCGCGGGCCTCGTGCCCGGAATGCGGCGCGCTGAAGCACGGC 348 CGCACGCTGGCGCTCGCCAACAAGGAAAGCCTCGTGACGGCAACTCCTGATGCGG 408 AAAACCATTTATCTGGCAAACAAAGAAACGCTGGTGGTTTCCGGCGCGCGTTGTTTATGGAA ATGTGCGCCATCGTCGGGGGCGTGGGGCTGCCTTCCGCGCTCGCAGCGGCGCAAAAAAGGC Similarity Conservative 18.4%; Score 217.2; Pred. No. 1.2e 0; Mismatches 1.2e-27; DB 21; Length 888 15; Gaps 120 60

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CAGGCGCTGGCGGGCGAGGACACGG-----

-- CCTGCGTCGAGCGCGTCATC

513

240

468

180

ACCGCCCGTGCAAACGCCGCGGCAGTGCTGCCCGTCGACAGCGAACACGCCGTTTTC

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RESULT 14
AAA52
AAA 52058
ID AAA52
XX AA52
XX AA52
XX AA52
XX AA52
XX AYCOL
XX Drug
XX Drug
XX Drug
XX Drug
XX 17-M2
PF 113-NC
PF 112-NC
PR 112-NC
PR 112-NC
PR 112-NC
PR 112-NC
PR 112-NC
PR 112-NC
PR 112-NC
PR 112-NC
PR 112-NC
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                                                     2001-329193/34
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99US-0165124.
2000US-0179531.
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Matches
                                                                                               Query Match
Best Local :
                                                                                                                                                                                                                                                                       polypeptide sequence that may be a drug target, or essential for growth or viability of an organism. Polypucleotide sequences AAH51947 - AAH52092 represent DNA encoding proteins AAG81096 - AAG81241, MycDacterium tuberculosis proteins which are potential drug targets. The DNA and protein sequences are used to illustrate the method of the invention. The method involves providing an unknown nucleotide or polypeptide sequences, and comparing it to a number of sequences along with at least one algorithm capable of analysing a functional relationship between nucleotide and polypeptide sequences. The method is useful for characterising the function of nucleic acids and polypeptides that may be useful as a target for a drug or essential for the growth or viability of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Identifying nucleotide or polypeptide sequence for use as drug target, involves providing algorithm that analyzes a functional relationship between nucleotide or polypeptide sequences, and comparing the
                                                                                                                                                                                        Sequence 1311 BP;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     This invention relates to a method for identifying a nucleotide
                                                                                                                                                                                                                                                       an organism.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Disclosure; Page 125-126;
462;
                                                                                               Similarity
                                                              Conservative
                                                                                                                                                                                        201 A; 429 C; 461
                                                                                            18.2%;
54.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    207pp; English
                                                              0
                                                           Score 215.6; DB 22;
Pred. No. 2.2e-27;
0; Mismatches 384;
                                                                                                                                                                                        G; 220 T; 0 other;
                                                              Indels
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δÃ ρ δÃ 밁 Qy 밁 δÃ Ъ δÃ 뫄 밁 ΩV 뫄 δÃ Db 밁 Qγ 밁 Ωy 밁 δÃ 밁 861 876 816 681 696 621 636 561 576 516 462 402 342 741 756 501 441 381 321 282 261 GGCCGCCGACCGGCCGGCCGACTGGACCATGTCGGCCATCGTGGGCGCCGCGGGCCTCGT CCTCGCACAGATTGCGAGCCTCACCTTCCAGAAGCCTTGACGAGGAACGCTTTCCGGCCCT GATGGTGGGCTTCTGCGACGGGGGCCTGATGGCCCATCTCGGCCCGGCCGACATGCGCCA CTTCGGCTTCGAGCCGGACCGGATCGAGCGGTCGTCCATCCGCAATCCATCGTCCATGC CTCCATCGACAGCGCCTCGATGTTCAACAAGGCGCTCGAGCTGATCGAGACGCGCGAATT GGTCGACTCCGAACACTCCGCGCTGGCCCAGTGCCTGCGCGGCGGCACTCCCGACGACGACGA CGTGACGGCAGGCCAACTCCTGATGCGGACGGCCCAGGAGAACGGCGCCACGATCCTGCC GCCCGGAATGCGGCCGCAAGCAAGGAAAGCCT GCACGCGCGCAGCGGCGACATCCCCTACCACGGATCCGACGCCGCCACCCGGCT ACCGATTTCGTTAGCGCTGGGCTGGCCGCGTCGGGTCAGCGGCGCCGCTGCTGTGA GTTCGGCATCCCCTACGACCGCATCGATGTCGTGCTGCACCCCCAGTCGATCATCCATTC CACGCTGAATTCGGCGTCGCTGGTCAACAAGGGACTTGAGGTCATCGAAACCCACCTGCT CGAGCATGTCACCCCGAGCAGGCTGGCGCGCATCCTACGTGGTCGATGGGCCCGATGAA CCGCGCCTGCACCGTGGCCGAGGCCGCAGGCCCATCCCAACTGGTCCATGGGCCAGCGGAT CGAGCGCGTCATCATCACGGCGTCCGGCGGGCCGTTCCGCGACTGGAGCCTCGAGCGCAT GGTGGACAGCGAGCACTCCGCGGTCTTTCAGGCGCTGGCGGGGGAGGACACGGCCTGCGT GGTCGCCGGTGGTTCGCTGGTGCTGCGGGCGGCGGG-----CCCGGTCAGATCGTGCC GGTCGAGCAGACCGAGGCCGACGTCGTCCTCAATGCGCTGGTCGGCGCGCGTTGGGCCTGCG GATGGTCACCTTCATCGACGGTTCGACGATCGCCCAGGCCAGTCCCCCGGACATGAAGCT CGCCAAGCTGGTGCTGACGGCCTCGGGAGGGCCGTTTCGGGGGCTGGTCCGCGGCCGACCT ACCGACGTTGGCCGCGCTCAAGACGGGTGCCCGGCTGGCCGCTGGCCAACAAGGAATCGCT Ξ 935 695 341 920 860 875 800 815 740 755 680 620 635 560 575 500 515 440 461 380 401 320

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RESULT 15
AA199683/c
ID AA1996
XX AA1996
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                                                                                  Matches
                                                                                                                                                                                                                                                                                                                                                               The invention relates to evaluating strain variation within and between different populations of the tuberculosis bacterial pathogen, Mycobacterium tuberculosis or related Mycobacterium by determining the nucleotide sequence of the first strain at positions in the complete sequence of the genome that correspond to positions that differ in the nucleotide sequences of M. tuberculosis strains CDC 1551 (AA199683) and H37RV (AA199682). The method is useful for evaluating strain variation of the complete sequences of M. tuberculosis and has valuable application in the fields of the complete sequences of M. tuberculosis and has valuable application in the fields of the complete sequences of M. tuberculosis and has valuable application in the fields of the complete sequences.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Claim 4; SEQ ID NO 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Evaluating strain variation of Mycobacterium tuberculosis, comprises determining the nucleotide sequence of the strain at positions in the genome corresponding to positions where M. tuberculosis strains CDC 1551 and H37Rv differ |
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Fleischmann
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mycobacterium tuberculosi variation; epidemiology;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1056
                                                                                                                                                                                       Sequence 4403765 BP;
                                                                                                                                                                                                                                                               specification,
                                                                                                                                                                                                                                                                                               Note: The
                                                                                                                                                                                                                                                                                                                        monitoring
                                                                                                                                                                                                                                                                                                                                           tuberculosis genetics, epidemiology,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1041
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                                                                               Local Sir
hes 461;
                                                                                                                                                                                                                                      seqdata.uspto.gov/sequence.html?DocID=6294328B1.
CATCATCGCCGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GGTGGTCGAGGA
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                                                                                                        Similarity
                                                                                                                                                                                                                                                            sequence data for this patent did not form part of the printed tion, but was obtained in electronic format directly from USPTO
                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ₽,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GENOMIC RES.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tuberculosis strain H37Rv
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                                                                                                  18.2%;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Fraser
                                                                                                  Score 214.6; DB
Pred. No. 1.7e-27
                                                                               Mismatches
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                                                                                                                                DB 22;
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US-09-673-198-31

Run on:

OM nucleic - nucleic search, using sw model

GenCore version 5.1.4_p5_4578 Copyright (c) 1993 - 2003 Compugen Ltd.

April 22, 2003, 00:00:39 ; Search time 3441 Seconds (without alignments) 9996.953 Million cell updates/sec

Sequence:

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Post-processing: Minimum Match 0%
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Listing first 45 summaries
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Pred. No.

15

the number of results predicted by chance to have a

score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

TITL	REFERENCI · AUTHOR	SOURCE ORGA	ACCESSION VERSION KEYWORDS	E59203 LOCUS DEFINIT		4.4	C 43		. c 39			c 34	33	. u u		c 27	25		c c 22	20 21	19		c 15	C 13	c 11 12			ი ი 7	σ.	- ω	21	Result No.	
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or nerbicidally active compound	, Ozaki,A., Set,H., Ku	subdivision; Rhodobacter group;		DNA linear PAT 31-JAN-2002 or herbicidally active compound.		AF367205 Oryza sat	Trepon	Salmo		Coryn	C Li	 	Bacillus s	, Y					<u>`</u>	Sequenc	AX398486 Sequence	Neisser	Neis	Xant	~ 0.	Pseu	Ralsto				H O	; ≌.	

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PI TOMOHISA KUZUYAMA, SHUNJI TAKAHASHI
PC (C12N15/09, A01N57/12, C12N1/21, C12R1:18), (C12P23/00, C12R1:19), (C12P23/00, C12
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SANKYO CO LTD
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PD 31-OCT-200
PF 12-APR-19
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JP 2000300257-A/23
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JP 2000300256-A/23.
Rhodobacter sphaeroides.
Rhodobacter sphaeroides
Bacteria; Proteobacteria; a
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Process of microbial production
Patent: JP 2000300256-A 23 31-OC
KYOWA HAKKO KOGYO CO LTD
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E64384
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I TOMOHISA KUZUYAMA, SHUNJI TAKAHASHI
C C12N15,09,C12P7/04,C12P7/26,C12P13/00,C12P21/02//(C12P7/04,
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JP 2000300256-A/23
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(C12P7/26,C12R1:18),(C12P7/26,C12R1:01),(C12P3/00,C12R1:19),
(C12P13/00,C12R1:18),(C12P13/00,C12R1:01),(C12P3/02,
:19), PC (C12P21/02,C12R1:18),(C12P21/02,C12R1:01),C12N15/00
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                                                                                                                                   CCGCAATCCATCGTCCATGCGATGGTGGGCTTCTGCGACGGGGGCCTGATGGCCCATCTC
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/db_xref="taxon:1063"
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T (bases 1 to 733800)
Capela,D., Barloy-Hubler,F., Gouzy,J., Bothe,G., Ampe,F., Batut,J.

**BOISTATE,F., Becker,A., Boutry,M., Cadieu,E., Dreano,S., Gloux,S.
Godrie,T., Goffeau,A., Kahn,D., Kiss,E., Lelaure,V., Masuy,D., Pohl,T., Portetelle,D., Puehler,A., Purnelle,B., Ramsperger,U., Pohl,T., Portetelle,D., Puehler,A., Weidner,S. and Galibert,F.

**Renard,C., Thebault,P., Vandenbol,M., Weidner,S. and Galibert,F.

**Analysis of the chromosome sequence of the legume symbiont
Sinorhizobium meliloti strain 1021

**Proc. Natl. Acad. Sci. U.S.A. 98 (17), 9877-9882 (2001)
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AL591792 AL591688
AL591792.1 GI:15075850
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complement(233...1114)

/gene="SMC04043"
/gene="sMC04043"
/function="miscellaneous; hypothetical/global
/note="Product confidence: hypothetical
gene name confidence: hypothetical
predicted by Codon_usage.
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predicted by FrameD" /codon_start=1 /evidence=not_experimental /transl_table=11 /product="PROBABLE PSEUDOAZURIN (BLUE COPPER PROTEIN)" /product="PROBABLE PSEUDOAZURIN (BLUE COPPER PROTEIN)" /protein_id="CAC47409.1" /protein_id="CAC47409.1" /protein_id="CAC47409.1" /protein_id="CAC47409.1" /db_xref="SPTREMBL:Q92M26" /translation="MKTKMMLLAMLCATSAGQANAEEYRVEMLNKAADGRVWAFEPAV /TRAOPGDTVTFVAKDKGHNSALMKGGAPEGAETWKGKINEEITVTLSKPGVYMYQCAP /translation="MKTKMMLLAMLCATSAGQANAEEYRVEMLNKAADGRVWAFEPAV /TRAOPGDTVTFVAKDKGHNSALMKGGAPEGAETWKGKINEEITVTLSKPGVYMYQCAP /translation="MKTHLAMLCATSAGQANAEEYRVEMLNKAADGRVWAYCAP /translation="mail molecule metabolism: energy transfer: /function="smc104048" /function="smc104048" /function="smail molecule metabolism: energy transfer: /function="smai	/note="REP (repetitive extragenic palindromic) element; predicted by Homology" /evidence=not_experimental 5027. :5084 /note="Sm-4 OR SMc04584 REPEAT SM-4 predicted by Homology" /evidence=not_experimental 5094. :5542 /note="Sm-2 OR SMc04873 REPEAT SM-2 predicted by Homology" /evidence=not_experimental complement(5586. :6029) gene="azu2 OR SMc04047" complement(5586. :6029) /gene="azu2 OR SMc04047" complement(5586. :6029) /gene=	/evidence=not_experimental complement(44704874) /gene="SMC04046" complement(44704874) /gene="SMC04046" /function="miscellaneous; hypothetical/global homology" /function="miscellaneous; hypothetical gene name confidence : hypothetical predicted by Codon_usage predicted by FrameD" /codon_start=1 /cvidence=not_experimental /transl_table=1 /fransl_table=1 /product="CONSERVED HYPOTHETICAL PROTEIN" /protein_i="CAC47408.1" /db_xref="GI:15075854" /db_xref="GI:15075854" /db_xref="GI:15075854" /db_xref="GI:15075854" /db_xref="GI:15075854" /db_xref="GI:15075854" /db_xref="GI:15075854" /db_xref="GI:15075854" /db_xref="GI:15075854"

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Agrobacterium tumefaciens str. C58 (Cereon)
Bacteria; Proteobacteria; alpha subdivision; Rhizobiaceae
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/note="probable transcription regulator
/note="probable transcription regulator
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aminotransferase-related protein - Deinococcus radiodurans
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section 232
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3195. | 4121
                                                                                                                                                                   /translation="MLVLVFIPFDPRLSETAQALPGRIVTFNRAITDFGTFRWALYST
GALAILAYVAARVLQAQTYGGRLRTAWRLLAYFFLTIGTASILVHTLKFLIGRARPEL
FLEMGAYSLTPFTGDNLYESFPSGHSTAAGAFFGVFAMLMPRFRWAFLLLALVIGVSR
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PLVVPÄICRIEPGLIGSAVIGLKYAQEIARPS"
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IDVKGLLIAPGFIDLQVNGGGGVMFNNQPDVEGIARICSAHARFGTTALMVTLITDRP
DVISKAAQAGIAASKKQVPGFLGLHFFGPHLSVARKGTHDPALVKKMETADLAVLIGC
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2025., .3191
                                                                                                                                           VIVGAHYPSDVAAGLLLGLWTAMAFAFIFARFEMLFRFDAQGWPQPKNASPPAAETR"
                                                                                                                                                                                                                                                         /product="AGR_C_4732p"
/protein_id="AAK88333.1"
/db_xref="GI:15157811"
                                                                                                                                                                                                                                                                                                                                                                                                        Pseudomonas aeruginosa
                                                                                                                                                                                                                                                                                                                                                                                                                                      /gene="AGR_C_4732"
/note="hwwrit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   complement(5419. .6072)
/gene=|"AGR_C_4732"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FVRAIIRFPLLSHLTGRLVGLGFRREKIETP'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TETMGHAGSRQGFVMINRGDYWQCGYVVRKGFFADIKLEGLEAFRYRVAEICPFPRER
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GGLTVETPEGVIEIAADLVVGADGRNSIVREAAGLEVQRFGIPTEVLWLRLSKQPDDP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /product="AGR_C_4730p"
/protein_id="AAK88332.1"
/db_xref="GI:15157810"
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ADDFVIAESEIG$GQGHRVVFGVILGTGVGGGLVIDGKLINSHGGFAGEWGHGPVAAT
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/protein_id="AAK88330.1"
/db_xref="GI:15157808"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ILVPVLVSGRAIRDDDLAAIEKRRSFPTKATQFLQRMMRIGRKKGQEERAEKPKGPPA
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/db_xref="GI:15157809"
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/gene="AGR_C_4726"
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\SGIDVVVVEKHGDFLRDFRGDTIHPSTLELMEQLGFIDEFLSLPHTRAPRLNAVIGG
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orted} - Xylella fastidiosa (strain 9a5c)"
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AGR_C_4730"
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1-DEOXY-D-XYLULOSE 5-PHOSPHATE REDUCTOISOMERASE
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                                                                                "AGR_C_4736"
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1 H37RV)"
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  (group Ol strain N16961)"
                                _C_4736"
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  GGCGCCGCGGGCCTCGTGCCCGGAATGCGGGCGCTGAAGCACGGCCGCACGCTGGCGCTC
                                                                   GCGCAGGCCATCGCCGAGGCCGACCGGCCGGCCGACTGGACCATGTCGGCCATCGTG
                                                                                                                                                                                                                                 CGGCGACTGGCCGAAATGGCGCGTGCGCTGAAGGCGGAGCTTGCCGTCACCGCGCATGAG
                                                                                                                                                                                                                                                                                             CGTCAACTGGGTGGCCGCGACGGGTTCGAGATCATGGCGCTGACCGGCGCGGGAAACATC
                                                                                                                                                                                                                                                                                                                                    CGCAGCCTGTCGATCTTTGGGGGCCACCGGCTCCATCGGCGAATCCACCTTCGACCTCGTC
                                         ATGGCCGGCCTTGAAGAGGCAGCCTCGATGGATGCCGGCTGGGTGATGGCCGCGATTGCC
                                                                                                                             GATAAATATGAAGCGCTGAAATCGGCGCTGGCAGGCACCGGCATCAAAGTCGCCGCAGGC
                                                                                                                                                                    GCGCTTCTGGCCGAACAGGCGCGGGAATTTGGCGGCGCAGCTCGCGGTCACTGCGGACGAT 6454
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/product="AGR_C_4740p"
/protein_id="AAK88336.1"
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/translation="MGRLPSRRAHCNVGESFMKKAIIFALVGLSLASCTQTEKGASIG
AVSGAVIGGAVTGNVRGAAVGAAIGGVGGALIGNASEPGYCYYRDQYGQRYTARCR"
1 2842 c 2765 g 1855 t
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GSTAVCDFIRSFASGFIFTTALPPSLAAGAIASIQHLKASPFERARHQDRVRKLRGLL
DARGIPHMDNPSHIVPVMVGDAAKCKWISDILLDNHGVYVQPINYPTVPRKTERLRIT
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Agniallæqareergaqlavtaddkyealksalagtgikvanggleeaasmdagw

vmaalagtpglaptltaarrgadlalankeclysagdvertvkggggglipvdses

AIPQCLTgeykgavertvltasggpprtwsrdemsnvtadlarahpnusmelkvsiges

AIMFUNGLEMIEAKYLFDLRPDQVDVIVHPQSIIHSNVGYTDGSYIAQLGSPDMRTAI

SYALTYPERGNLSVERLDFAKLARLDFEAPDEARFPALRLARMALERGGLQGAALNAA
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NISGTNHYHVLLEQELADLHGKESALIFTSGYVSNWATLGTLGQKIPGLIIFSDALNH
ASMIEGIRYGRCERVIWKHNDLEDLEAKLKAADPNAPKLIAFESVYSMDGDIAPIREI
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/protein_id="AAK88335_1"
/db_xref="GI:15157813"
/translation="MTVPVSERKTVWSILEHGMDFEAFFTTELQSLHSEGRYRVFADI
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/protein_id="AAK88334.1"
/db_xref="GI:15157812"
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(Delta-aminolevulinate synthase) (Delta-ala synthetase)"
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Pred. No. 2.8e-40;
0; Mismatches 423;
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Jung, M.,

Paulsen, I.,

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REFERENCE
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Krespan,W., Perry,M., Gordon-Kamm,B., Liao,L., Kim,S., Hendrick,C.,
Zhao,Z., Dolan,M., Tingey,S.V., Tomb,J., Gordon,M.P., Olson,M.V.
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                                                                                    LHGKESALIFTSGYVSNWATLGTLGQKIPGLIIFSDALNHASMIEGIRYGRCERVIWK HNDLEDLEAKLKAADPNAPKLIAFESYYSMOGOIAPIREICDLADRYGAMTYLDEVHA VGMYGPGGGIAEREGLMDRUFIIEGTLGKAFGYWGGYITGSTAVCDPIRSFASGFITTTALPPSLAAGAIASIQHLKASPFERARHQDRVRKLRGLLDARGIPHMDNPSHIVPVM
                                                                                                                                                                                                                                                                                                                          complement(1312.
/gene="hemA"
                                               VGDAAKCKWISDILLDNHGVYVQPINYPTVPRKTERLRITPTPLHTDADIEQLVGALH
QLWSHCALARAVA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ASMFNKGLEMIEAKYLFDLRPDQVDVIVHPQSIIHSMVGYTDGSYIAQLGSPDMRTAI
SYALTYPERGNLSVERLDFAKLARLDFEAPDEARFPALRLARMALERGGLQGAALNAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /translation="MTNASEMPRKLTILGSTGSIGTWTLDVVROLGGRDGFEIMALTG
AGNIALLAEQAREFGAQLAVIADDKY EALKSALAGTGIKVAAGMAGLEEAASMDAGW
VMAALAGTFQLAPTLTAARRGADIALANKECLVSAGDVFLRTVKQGGGRLIPVDSEHS
AIFQCLTGEYKQAVERIVLTASGGPFRTWSRDEMSNVTADIARAHPNWSMGLKVSIGS
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Washington)"
                                                                                                                                                                                /codon_start=1
/trans1_table=11
/product="5-aminolevulinate synthase"
/protein_id="AAL43594.1"
/db_xref="GI:17741112"
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                                                                                                                                                                                                                                                                                   /note="identified by sequence
located using Blastx/Glimmer"
                                                                                                                                                                                                                                                                                                                                                                   /note="Atu2613"
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/db_xref="GI:17741111"
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located using Blastx/Glimmer"
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9612. !10103
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LDRQKI DANANVQTENGTA I PELHVAVGRRI LINGKI LOFSQOFLPTONLSFINPDLAL
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LAINGKI SADSVNAGTAA I SGLNATI CHSGTTTA FDVNGRI UNARLIVVKGSADTGGS
MTVRVDTFSAAPKG I PVRLEKPSTI AI QNGTARI ADLTI I TGDGRVEVNGTAGSTLDI
KADI RSILPASLANAFAAGLDAAGS I SGTVSAKGAASDPSVDV KIMWANAEVAQTRAAG
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FDRDRAYI SRLTGKLVGGGT I SGTGSVG I AGGGSGFPADI SI TLDRAGY NDGTLVTTVV
SGTLTLKGPLLNSPALGGNLTILDRSATI I PEKLPASI.FE IDVKRIA, P FVVRAQAKAL
SGTLTLKGPLLNSPALGGNLTILDRSATI I PEKLPASI.FE I TVGTANAUGH LOGGERAL
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5814. 9458
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/note-"identified by sequence similarity; putative;
located using Blastx/Glimmer"
                                                                                             /gene="cheW"
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                                                                                                               CAATCCATCGTCCATGCGATGGTGGGCCTTCTGCGACGGGGGCCTGATGGCCCCATCTCGGC
                                                                                                                                                                                                                                            TCCATGGGCCAGCGGATCTCCATCGACAGCGCCTCGATGTTCAACAAGGCGCTTCGAGCTG
 CCCGTCGCCCGGATCGACCTCGCACAGATTGCGAGCCTCACCTTCCCAGAAGCCTGACGAG
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                                                            CCCGCCGACATGCGCCACGCCATCGGATTCGCGCTGAACTGGCCGGGTCGCGGCGAGGTG
                                                                                               CAATCGATCCATTCGATGGTTGGCTACACTGACGGCTCCTATATCGCGCAGCTCGGC
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                                TCTCCCGACATGCGCACCGCCATCTCCTATGCCCTCACCTATCCTGAGCGCGGCAATCTA
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/protein_id="AAL43598.1"
/db_xref="GI:17741116"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1007
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GCCGCCTTCAACGCGGCCAAGGAGATCGCGCTCGATCATTTCATCGCCGGACGCATCGGG 1023
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AGCGTCGAGCGCCTGGATTTCGCGAAACTGGCACGGCTCGATTTCGAAGCACCGGACGAA 1006
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TTTCTCGACATGGCCGAAATTGTTGAAACGGTGATGGACCGTATGCATGACGGCCGCACC 1186
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Haft,D.H., Kolonay,J.F., Smit,J., Craven,M.B., Khouri,H.,
Shetty,J., Berry,K., Utterback,T., Tran,K., Wolf,A., Vama
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Nierman, W.C., Feldblyum, T.V., Paulsen, I.T., Nelson, K.E., Eisen, J., Heidelberg, J.F., Alley, M.R.K., Ohta, N., Maddock, J.R., Potocka, I., Nelson, W.C., Newton, A., Stephens, C., Phadke, N.D., Ely, B., Laub, M.T., DeBoy, R.T., Dodson, R.J., Durkin, A.S., Geinn, M.L., Laub, M.T., DeBoy, R.T., Dodson, R.J., Durkin, A.S., Geinn, M.L., Laub, M.T., DeBoy, R.T., Dodson, R.J., Durkin, A.S., Geinn, M.L., Laub, M.T., Deboy, R.T., Dodson, R.J., Durkin, A.S., Geinn, M.L., Laub, M.T., Deboy, R.T., Dodson, R.J., Durkin, A.S., Geinn, M.L., Laub, M.T., Deboy, R.T., Dodson, R.J., Durkin, A.S., Geinn, M.L., Laub, M.T., Deboy, R.T., Dodson, R.J., Durkin, A.S., Geinn, M.L., Laub, M.T., Deboy, R.T., Dodson, R.J., Durkin, A.S., Geinn, M.L., Laub, M.T., Deboy, R.T., Dodson, R.J., Durkin, A.S., Geinn, M.L., Laub, M.T., Deboy, R.T., Dodson, R.J., Durkin, A.S., Geinn, M.L., Laub, M.T., Deboy, R.T., Dodson, R.J., Durkin, A.S., Geinn, M.L., Laub, M.T., Deboy, R.T., Dodson, R.J., Durkin, A.S., Geinn, M.T., Deboy, R.T., De
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           I (bases 1 to 12977)
Nierman, W.C., Feldbly
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Caulobacter crescentus CB15
Caulobacter crescentus CB15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Complete genome sequence of Caulobacter crescentus Proc. Natl. Acad. Sci. U.S.A. 98 (7), 4136-4141 (2001)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Fraser,C.M
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Berry,K., Utterback,T.,
Berrolaeva,M., White,O.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Haft,D.H.,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GI:13423361
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                                                          £002 97:40
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Salzberg, S.L.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Tran,K., Wolf,A., Vamathevan,J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Salzberg, S.L., Venter, J.C.,
                                                                                                                                                                                                                                                                                                                                                                                                           stitute for Genomic
                                                                                                                                                                                                                                                                                                                                                                 20850,
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n 191 of 359
                                                                                                                                                                                                                                                            scentus CB15'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Shapiro, L., Venter, J.C.
                                                                                                                                                                                                                                                                                                                                                                    USA
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359 of the
protein family HMM
                                                                                                                                                                                                                                                                                                                                                                                                           Research,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BCT 12-JUN-2002
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CDS gene

dehydratase"

_table=11

/product="(3R)-hydroxymyristoyl-(acyl-carrier-protein)

/note="identified by match to protein

family HMM"

/gene="CC1912"

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gene

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GGKAGVADHLNIGSGASIGAAASVFKDVPDGETWTGFPARPLKRWLRETAWLSRMAGG

GANSCVDRGAFGDTTIGENTKIDNLVHVAHNVRIGRNCVLAAYTGVSGSTVVGDGVAF YCRIGANAVIGFAMLGDNVAISAGAVIGEAGFGAALGPRGMVDLPQLGRVVIQDNVTL N-acyltransferase" /protein_id="AAK23888.1" /db_xref="GI:13423366"

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CDS

complement(3389. .4408) complement(3389. .4408)

/gene="CC1913"

/note="identified by match

ţ

protein family HMM"

/codon_start=: /gene="CC1913"

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complement(2119.
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                                                                                                                                 VTT IGSDGLYMVGSHVAHDCTVGDFVVLAKGATLGGHVA IGDYVFMGGLAAAHQFSR I
GRYSF IGGLAAVTKDV I PYGSVWGNHAHLEGLNLVGLKRRGF PRET I NALRAAYRLMF
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acetylglucosamine O-acyltransferase"
/protein_id="AAK23886 1"
/db_xref="GI:13423364"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complement(1267.
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ALGRAG"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WGFNIRLAHALRRLDPTLPLVKYVAPQVWAYREGRAQALAKAVDLLLSIQPMDKAYFD
AAGLQNVFVGNSALAKRFDHADPGRLRAAIGAAASQQILLVLPGSRPSEIERVMPAFE
complement(2907.
                                                                complement (2907.
                                                                                                   ADEGTFQERLDDVAEIHAGNAEVMEIVDFIRTDANRPLCLPEREV"
                                                                                                                                                                                                  VEGATT IGEGCVVHSFANLGGPPQHLGHKGERTELI IGPRNI I REHVTMHTGTASGKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          complement(2119.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EIGRLDIGQGAVVCEGLVLAVEAQEGTDAMLRRVADLPEAIRGRAERRLGVLAKAPKP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GDDALLRRVLDEFEKEGFEIEGAHEVMGEMTLPRGRLGKVSPAPEHMADIDKALDVAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /product="conserved hypothetical protein"
/protein_id="AAK23885.1"
/db_xref="GI:13423363"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             complement(1267.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DAVRRLKVERPDLHIYVPAAYTVAEAVKARVAGWPFRAHVIEDEGLKDDAFLAGDVAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GGAKMAEQGVQSPFDIAQLSILGILESLKAYPRAMARLKDTVALAAREKPDVAVLIDS
                                  /gene="CC1912"
                                                                                                                                                                                                                                                                                                                                                                                                                             /codon_start=:
                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="identified by match to protein family HMM"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /gene="CC1911
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IQETRVDLPTIGVATIHRAARAGLAGIVGEAGRLLVVDREAVIAAADDLGLFVLGVDF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PGADVGIGEFGKIFKALRAEGCDVVCFAGNVSRPDFSALMPDARGLKVLPSLIVAARK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /codon_start=]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         note="identified by Glimmer2; putative"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /gene="CC1910"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /gene="CC1910"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           translation="MTINRDKPLKVMLVAAEASGDALGAGLAKALRARLGQGVTFVGI/
                                                                                                                                                                                                                                                                                                                                                                                           transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               transl_table=11/
                                                                                                                                                                                                                                 translation="MSIHPTAIIAPEAKLAPDVEVGPFSIVGPDVTLAAGVRLLSHVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          translation="MRKLGLIAGGGALPVELASHCEAAGRAFAVMRLRSFADPSLDRY"
   .3386)
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                                                                    .3386)
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CDS

gene

CDS gene CDS

gene

start-

intified

by Glimmer2;

putative"

Query Match Best Local

Similarity

29.8%;

Pred. No. 3.4e-31;

DB 1;

Length 12977;

5100)

gene CDS

> AVAAFLDRRIGFLDIAGAVAGTLERMNSLGDLSVAESDAVETAMLIDGSARRIAAEVV MNKGLEMIEASYLFATPEDRYDVYIHPQSVIHSLVEYYDGSTLAQLGPPDMRAPIACA FAWPDRLPWPAPRLDLAAYGQLTFESPDVERFPAIGIAREALRLGGGAPAAMNAANEV

δõ Q Qγ Qγ Вþ B Ъ B Qy В QY B Qy 밁 ρy δÃ В δÃ B В Ş В γQ 밁 δÃ Ф Qy 맑 Qy 밁 δÃ В QΥ Matches 9107 9167 9047 9287 9347 9407 9647 9767 9881 9227 9467 9587 9707 844 784 664 604 544 484 424 364 304 184 124 244 64 4 GCCGCCTTCAACGCGGCCAAGGAGATCGCGCTCGATCATTTCATCGCCGGACGCATCGGG 1023 CCCGCCGACATGCGCCACGCCATCGGATTCGCGCTGAACTGGCCGGGTCGCGGCGAGGTG GAACGCTTTCCGGCCCTGAGGCTTGCGCGAGACGTCATGGCGGCGCGCGGCCTGTCGGGC CCTGCGCCGCGCCTTGATCTAGCCGCCTACGGCCAGCTCACCTTCGAATCGCCCGACGTC CCCGTCGCCCGGATCGACCTCGCACAGATTGCGAGCCTCACCTTCCAGAAGCCTGACGAG CCGCCGGACATGCGCGCGCGATCGCCTGCGCCTTCGCATGGCCGGATCGTCTGCCGTGG CAATCGGTGATCCATAGCCTCGTAGAGTATGTCGACGGTTCGACCTTGGCGCAGCTTGGC CAATCCATCGTCCATGCGATGGTGGGCTTCTGCGACGGGGGCCTGATGGCCCATCTCGGC GGCGCCACGATCCTGCCGGTGGACAGCGAGCACTCCGCGGTCTTTCAGGCGCTGGCGGGC CGCAAGGTGGTGGTAGGCTCGACCGGATCGATCGGCCTTTCGACCTTGAGCCTGTTC CGCAGCCTGTCGATCTTTGGGGCCCACCGGCTCCATCGGCGAATCCACCTTCGACCTCGTC GAGCGGTTCCCCGCAATCGGGATCGCGCGCGAAGCGCTGAGGTTGGGCGGGGGGCGCGCCG ATCGAGGCGTCCTATCTGTTCGCAACCCCGGAAGACCGCGTCGACGTCGTGATTCATCCG ATCGAGACGCGCGAATTCTTCGGCTTCGAGCCGGACCGGATCGAGGCGGTCGTCCATCCG TCGATGGGCGCCAAGATTTCGGTCGATTCCGCGACGATGATGAACAAGGGCCTCGAGATG TCCATGGGCCAGCGGATCTCCATCGACAGCGCCTCGATGTTCAACAAGGCGCTCGAGCTG TGGAGCCTCGAGCGCATCCGCGCCTGCACCGTGGCCGAGGCGCAGGCCCATCCCAACTGG GAGTGCGCGCACCGCGTATCACGCCTGATCCTGACGGCCTCTGGCGGGCCCTTCCGGACC GAGGACACGGCCTGCGTCGAGCGCGTCATCATCACGGCGTCCGGCGGGCCGTTCCGCGAC GGCGGGTCGGTCATTCCTGTCGACTCGGAACACTCGGCCATTTTTCAGGTGCTTCAGTCC GCCAACAAGGAAAGCCTCGTGACGGCAGGGCCAACTCCTGATGCGGACGGCCCAGGAGAAC GGCGCCGCGGGCCTCGTGCCCCGGAATGCGGGCGCTGAAGCACGGCCGCACGCTGGCGCTC GCGCAGGCCATCGCCGAGGCCGCCGACCGGCCGACTGGACCATGTCGGCCATCGTG CGGCGACTGGCCGAAATGGCGCGTGCGCTGAAGGCGGAGCTTGCCGTCACCGCGCATGAG 626; TGGGACAAGGCGGCTATGGCCCGCGCCACACCCGAGCAGGCGATCGCTCACCCGAACTGG GCCAACAAGGAGAGCCTTGTCTGCGCGGGGGCCGCTGCTGGCCATCGCCAAGGCCGCC GCCGACGCGGTTCGCGATGCTGCGGCCATGGGCGCGGACTGGGGTCATGTCGGCCCATCGTC GAAGAGTCCGGTGCGC----ATGCGGAAGGCGGGCCCGAGGCGTTCCGCACCGTCGCTCTGACCGGCGGGGCGCAACATC Conservative -CGGTTCAGATCCTGGCGCTCACCGCCGGTCGCAATGTC 0; Mismatches 429; 6. Gaps 9048 9168 9588 9648 9708 9822 963 903 843 9228 9288 9348 543 9408 483 9468 423 9528 363 183 9768 123 8928 9108 783 723 663 603 303 243 63 ۲,

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SKLRRAGAEKVVMLYRSAGKRMASLLTEPELEEYLDELSNANNLNLRIAQYLVGDNSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /translation="MLEMKATGKSKGQWMFYRNFDDTVDYLSDHTRILSYNPFCHKVE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PLDRDEAYRWHFRYTDPQNNPFDVIFNIQQETEILVDLPDEVASMDFEEMSDEMIRQF
YCKKITWRPLAQDKFFFWPWPEKYLFEGGOYTADMLIVPVQQEQTRVDFDLWVNVAFLLY
PAFRIVPEKVVRTWSTGMSLIMQTATNHMFQKISKEFGKIRKL"
COMPLEMEN (4707..5780)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /translation="MSKDAQQISALRRFSVSIISVALLVISGTVGYMYLENMSLLDAL
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LVGKSFQEVDLYNNHRINVVGYKLPDGELHTTPRPAEIIQKNGTIIVIGKSDDLEMLC
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /codon_start=1
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                                                                                                                                                                                                                                                                                                                        /note="identified by Glimmer2; putative"
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                                                                                                                                                                                                                                                                                                                                                                                                                           /product="hypothetical protein"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          complement(2867. .3898)
/gene="CT0121"
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2090. .2188
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KLAQGETOR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PF00881"
                                                                                                                                                  RIVVGGHS
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Chlorobium tepidum TLS section 12 of 194 of the complete genome.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Eisen, J.A., Nelson, K.E., Paulsen, I.T., Heidelberg, J.F., Wu, M., Dodson, R.J., Deboy, R., Gwinn, M.L., Nelson, W.C., Haft, D. H., Hickey, E.K., Peterson, J.D., Duxin, A.S., Kolonay, J.L., Yang, F., Holt, I., Umayam, L.A., Mason, T., Brenner, M., Shea, T.P., Parksey, D., Nierman, W.C., Feldblyum, T.V., Hansen, C.L., Craven, M.B., Radune, D., Vamarhevam, J., Khouri, H., White, O., Grüber, T.M., Ketchum, K.A., Venter, J.C., Tettelin, H., Bryant, D.A. and Fraser, C.M.
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I (bases I to 11150)

Elsen, J.A., Nelson, K.E., Paulsen, I.T., Heidelberg, J.F., Wu, M.,
Dodson, R.J., Deboy, R., Gwinn, M.L., Nelson, W.C., Haft, D.H.,
Hickey, E.K., Peterson, J.D., Durkin, A.S., Kolonay, J.L., Yang, F.,
Holt, I., Umayam, L.A., Mason, T., Brenner, M., Shea, T.P., Parkeey, D.
Nierman, W.C., Feldblyum, T.V., Hansen, C.L., Craven, M.B., Radune, D.,
Vamathevan, J., Khouri, H., White, O., Gruber, T.M., Ketchum, K.A.,
Venter, J.C., Tettelin, H., Bryant, D.A. and Fraser, C.M.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Genomic Research, 9712
   Chlorobium tepidum TLS
Bacteria; Chlorobi; Chlorobia; Chlorobiales; Chlorobiaceae;
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Proc. Natl. Acad. Sci. U.S.A. 99 (14), 9509-9514 (2002)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note="identified by Glimmer2; putative"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SVGEVGLAGHWLKFMLHYLFFHKAKGYPFWYLIPE"
                                                                                                                                               TTTCTGGACATGGCGGCGGTGGTCGAGGAGGCGCTCGCGGG 1064
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /organism="Chlorobium tepidum TLS"
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1830. .1988
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322. .1779
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AE012791.1 GI:21646016
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                                                       EVSLEVSGHNVYGILKFESGŸHRVQRVPETETĞGRIHTSAASVÄVLPEAEEVDVEIRK
EDLL IDTRESGGGGQONVRXETAVRITHVPSGIVVACQEERSQLQNRERAMKALRSK
LVDLQI TAEQOKSRADIRRSWYTTGDRSAKIRTYNFPQSRVTDHRIGFTSHALPQIMQG
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RLIVLAGGVAMNMVLAAVIFIGITSIFGESRTPITTPAFIEPKSVFSSMGMQSGDHLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                           KNSTGEPLTAALIRKKGQTITTEVTPNNSGKIGISLKQTIETERIKLSLPQALASGLN
QTWKTTVLTVQGFGKIFSGKEDFRKSVGGPIKIARIANQSAEQGPISPMYFVAVLSIS
LAIINILPIPALDGGQFVLNAIEGIMGREIPFEVKMRIQQVGMTLLLMLFAYFMINDL
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THTEDIARIITJASGGPFRKTPAEEKINVGPRQALKHPQWSMGAKITIOSATLANKGL
EVIEAHWIEDMPARICIGVVVHPOSIIHSMVEYIDGGVIAOLGGVPDMRAPIAYALAWPE
RCETGIGKLDLIKVATLIFFEEPDMERFPALRLAFDALKAGGTYPAVLNAANEIAVAAF
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                   VRAYDEWSRTKKOLDEAHSMOKNENDPEMRALVEEEAGELOERLPKLEQOLKILLLPK
                                       DEADSRNAIIEIRAGTGGDEAGLFAADLMRMYQRYAERQGWSCQTLEVSEGSVPGSLK
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/protein_id="AAM71373.1"
/db_xref="GI:21646025"
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Pred. No. 6.8e-26;
0; Mismatches 436;
                                                                                                                                                                                                                                                                                          /product="membrane-associated
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /product="acylphosphatase"
/protein_id="AAM71374.1"
                                                                                                                                                                     complement(5802. .7163)
/gene="CT0124"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /note="CT0125"
complement(7209. .8357)
/gene="dxr"
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/gene="CT0126"
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/gene="tRNA-Val-2"
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/transl_table=11
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-8349 CITATCCATTCTCGGCAGTACCGGCTCCATTGGACTCAGCACACACGTCAGGCG 8290

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AL646064 201050 bp DNA 11near BCT 07-DEC-2001
Ralstonia solanacearum GMI1000 chromosome, complete sequence;
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                                                                                                                                  CAAGCAAATCGATGAATTCAGGCCGTCACTGGTCTCGGTGACGAGGCGTCGCGGGA 8170
                                                                                                                                                                                                                            GCGCCTCAAGGGGATGCTCGGCGATCACAAGCCCGAAATTGTCTGTGCGGCCTCGAAGGTGC 8110
                                                                                                                                                                                                                                                                                                                                                                                                                8058 GGGTGCGGCAGGACTGGTGCCAACCGTCAGGGCTATTGAAGCCGGAAAGGACATCGCGCT 7999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1818 AACGCCCGCCGAAGAGTTGAAAAACGTCGGCCCGGAACAGGCGCTCAAGCACCCGCAGTG 7759
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GTCGATGGGCGCGAAGATCACCATCGACTCGGCGACCCTTATGAACAAAGGGCTCGAGGT 7699
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-----GAAGGGCGGGCCCGAGGCGTTCCGCACCGTCGCTCTGACCGGCGGCGCAACAT
                                          8289 TCATCCTGAAAGGTTTTCGATTGCGGCCCTTGCCGAGGGCCACGACGTGGAATGCTTCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GCCCGTCGCCCGGATCGACCTCGCACAGATTGCGAGCCTCACCTTCCAGAAGCCTGACGA
                                                                                         CCGGCGACTGGCCGAAATGGCGCGTGCGCTGAAGGCGGAGCTTGCCGTCACCGCCCATGA
                                                                                                                                                                                   303 GGGCGCCGCGGGCCTCGTGCCCGGAATGCGGGCGCTGAAGCACGGCCGCACGCTGGCGCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                             363 CGCCAACAAGGAAAGCCTCGTGACGCCAGGCCAACTCCTGATGCGGACGGCCCAGGAGAA
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SOURCE

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/product-"PROBABLE HOMOSERINE DEHYDROGENASE OXIDOREDUCTASE PROTEIN"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /translation="Movrstrchaepgsfsrillgglapdgglylpeqypqvsaeelt
rwrdlpyadlafeilrkfatdipeddlraltrrtytpevycnarngdntaditplhrl
geeagtslilclsngptlafkdmamqllgnlfeyaldrehaelnilgatsgdtgsaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FVFDLLGRDPARLAQLFRDVDEKGGFSMTGKPEFDRIAEFGFVSGRSTHEDRVNTIRD
VFVRYGTMVDTHTADGVKVARENLVPGVPMVVLETALPAKFGDTIREALDREPERPAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LAFQPDALSNTPLLPIEEVRSAYYLRMRVADETGVLADITRILAESGISIDAMLQKES
REGEPQTDIIMLSHVVVEKQVNAAIAAIEALPTVLSKVTRLRMEELN"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DLEYKARQKIGTVNSINWARVVAQVVYYFKGYLLAAPKIGDKVSFCVPSGNFGNVCAG
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                                                                                                                                                                                                                                                                                                                        /translation="MKPIKIGLLGLGTVGGGTLKVLQRNQEEIRRRAGRGIEVALIAV
                                                                                                                                                                                                                                                                                                                                                                                 VVTANKALLAVHGNEIFKAAQDKGVMVAFEAAVAGGIPIIKALREGLTGNRIEWIAGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IANVEGAMNAVVVQGDAVGPTLYYGKGAGAEPTASAVVADLVDVTRLHTADPEHRVPH
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/note="Product confidence : hypothetical
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /EC_number="4.2.99.2"
/function="small molecule metabolism; amino acid
biosynthesis; threonine"
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/protein_id-"CAD15030.1"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note="Product confidence: hypothetical Gene name confidence: hypothetical predicted by Codon_usage predicted by Homology predicted by FrameD"
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Gene name confidence : probable
predicted by Odon_usage
predicted by Homology
predicted by FrameD'
         confidence : hypothetical
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/transl_table=11
                              predicted by Codon_usage
predicted by Homology
predicted by FrameD"
                                                                                                                                                                                                                                                            /protein_id="CAD15029.1"
/db_xref="G1:17428342"
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2889. .4334
/gene="thrC"
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/db_xref="G1:17428344"
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/gene="RSc1329"
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/qene="RSc1329"
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/gene="moeA2"
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/gene="moeA2"
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/gene="thrC"
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Boucher, C.A.

Boucher, C.A.

Boucher, C.A.

Submitted (05-DEC-2001) Genoscope and CNRS UMR-8030, 2 rue Gaston
Submitted (05-DEC-2001) Genoscope and CNRS UMR-8030, 2 rue Gaston
Cremieux, CP5706, 91057 Evry Cedex, France, Laboratoire de Biologie
Moleculaire des Interactions Plantes-Microorganismes INRA-CNRS,
BP27, 31326 Castanet-Tolosan Cedex, France, Fondation Jean
Dausset-CEPH, 27 rue Juliette Dodu, 75010 Paris, France, Librance, Laboratoire de Biometrie et Intelligence Artificielle INRA, BP27,
E31326 Castanet-Tolosan Cedex. Laboratoire de Genetique Cellulaire
INRA, BP27, F31326 Castanet-Tolosan Cedex
Christian Boucher@toulouse.inra.fr
http://sequence.toulouse.inra.fr
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GASELIALATNALLDAGDELLLPAPDYPLWTAMTSLSGGTPVHYLCDESNGWMPDLDD
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FPRLDPSVYPIDDDQTFIRQLLEEERVLLVQGTGFNWHSPDHFRIVFLPHEDDLREAI
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                                                                                                                                                                                                                                                      Salamoubat, M., Genin, S., Artiguenave, F., Gouzy, J., Mangenot, S., Arlat, M., Billault, A., Brottier, P., Camus, J.C., Cattolico, L., Chandler, M., Choisne, N., Claudel-Frenard, C., Cunnacc, S., Demange, N., Gaspin, C., Lavie, M., Moisan, A., Robert, C., Saurin, W., Schiex, T., Siguier, P., Thebault, P., Whalen, M., Wincker, P., Levy, M., Genome sequence of the plant pathogen Ralstonia solanacearum Unpublished
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/protein_id="CAD15028.1"
                                                                                                                                                                              Bacteria; Proteobacteria; beta subdivision; Ralstonia group;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /EC_number="1.1.1.3"
/function="small molecule metabolism; amino acid
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/BC_number="2.6.1.1"
/function="small molecule metabolism;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /note="Product confidence : probable
Gene name confidence : hypothetical
predicted by Codon_usage
predicted by Homology
predicted by FrameD"
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206. .1447
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206. .1447
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segment 8/19.
AL646064 AL646052
AL646064.1 GI:17428340
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                                                                                                                     Ralstonia solanacearum.
Ralstonia solanacearum
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JOURNAL
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/db_xref="G1:J7428345"
//db_xref="G1:J7428345"
/translat.ion="wsanbapavkpsLltleaalLQLLaaargLtetetvpTLHangR VLAQAvksGinVPPBDNTQMDGYAVRAADITAPGTRLKVAQRIPAGGVGRPLQAGEAA RIFTGALIPPGADAVWQEQCKPDPDTGTVVIDHVPEAGEWIRRAGEDITAGAEILPR
                                                                                                                                                                                                                                                                                                         GTRLGAQQLGLAASVGCAGLQVVRRPRVAVFFTGDELAMPGEPLKPGAIYNSNEFTLR
ALLENLGCETTDFGIYPDTLQATROTLREAREAHDLIITSGGVSVGEBDHIKPAVEAE
GRLNLWQIAIKPGKPLAFGEVRRPQGWAGGPAAFFIGLPGNPVSSFVTFLLFVRFFIL
RLLGVDDVTPKRIPHRADFALPKGDRNUEFLRARINAGGGLDLFPNGSSGVLTSTVWG
DGLIDNPPNQPIAAGDTVAFLPFAGLV"
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(SUBUNIT 1) PROTEIN"

(Ab_xref="G1:17429346")

(translation="MDMQIELRFFASVREQLGTSHEAAAVPDTVRTVGELRRWLAARG PAMGETLAEGRALRWALDHDVVTADAPLREGCEVAFFPPVTGG")
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/function="small molecule metabolism; biosynthesis
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                                                                                                                                                                                    MOEA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         24;
                                                                                                                                                                                  /product="PUTATIVE MOLYBDOPTERIN BIOSYNTHESIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /gene="moaE"
/function="small molecule metabolism;
cofactors, carriers; molybdopterin"
/note="Product confidence : probable
Gene name confidence : probable
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                 cofactors, carriers; molybdopterin"
/note="Product confidence : putative
Gene name confidence : putative
predicted by Codon_usage
predicted by Homology
predicted by FrameD"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             cofactors, carriers; molybdopterin"
/note="Product confidence : probable
Gene name confidence : probable
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Pred. No. 9.1e-25;
0; Mismatches 448;
                                                                                                                                              /evidence=not_experimental
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/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  predicted by Codon_usage
predicted by Homology
predicted by FrameD"
                                                                                                                                                                                                                                                                                                                                                                                                                                   /note="RSc1331; RS02853"
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                                                                                                                             /codon_start-1
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57.08;
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                                                          GCCATCGTGGGCGCGCGGGGCCTCGTGCCCGGAATGCGGGCGCTGAAGCACGGCCGCACG
                                                                                                                   C---TGGCGCTCGCCAACAAGAAAGCCTCGTGACGGCAGGGCAACTCCTGATGCGGACG
                                                                                                                                                                              GCCCAGGAGAACGCCCACGATCCTGCCGGTGGACAGCGAGCACTCCGCGGGTCTTTCAG
                                                                                                                                                                                                                                      GCGCTGGCGGCGAGGACACGGCCT-----GCGTCGAGCGCGTCATCATCACGGCG
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Xanthomonas campestris pv. campestris str. ATCC 33913
Bacteria; Proteobacteria; gamma subdivision; Xanthomonas
Xanthomonas.
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ATLMNKGLEVIEAHHLFGLPGEQIDVLVHPQSLVHSLVEFVDGSTLAQLGLPDMRTTL
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RPVTATGLPFYENFYAGGTNSVRGFEDNTLGPRSEAINGFNRGQPLGGSLKTVGSVEM
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IPILDGGHLLYYLIELVKGSPISERAMIAGQYVGLAVLAGLMGLAFYNDILGLVPR"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DALLALCVLHRPAHAVIADAALYPALRDGLRAAGLTTQAHAGDQALDALAASDACDTV
VAAIVGAAGLSSTLAAAAAGKRLLLANKESLVLAGELLTRTAAAAGAEIIPIDSEHSA
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/db_xref="GI:21112428"
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FROBHGNGQARALKLAAGLAVLPAMAALVLLHANPDKGNUMLLTALTMWAADSGAY
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                      VDSNQITTFPGTTPQAIVDYIQAIGTDTFKAVRTEFGWARDTRNDFFMPTRGMYQRVG
                                                                                                                         YFPKLFDSPSARISAFFDFGNVYSDVDAFKANELRASTGVALLWRAPVGPISISYAFP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /product="1-deoxy-D-xylulose 5-phosphate reductoisomerase"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  /translation="MSGSSLRRVAVFGATGSIGASALDVIARHPERLRASVLSAGSKV
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note="identified by sequence similarity; putative; ORF located using Blastx/Glimmer/Genemark" /codon_start=1 /transl_table=11
                                                                                                                                                                                                                                                                                                                                  /note="identified by sequence similarity; putative; ORF located using Blastx/Glimmer/Genemark"
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                                                                                                                                                                                                 complement(2525. .3871)
/gene="XCC1366"
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                                                                                                                                                                                                                                                                         complement(2525. .3871)
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complement(3898. .5088)
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                                                                                                                                                                   LKKEDNDEIERLQFTFGGQF"
                                                                                                                                                                                                                                                                                                        /gene="XCC1366"
/note="identified by
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/note="identified by
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Lishing, J.B., Sena, J.B., Tsai, S.M., White, F.F., Setubal, J.C. and Santos, M., Truffi, D., Tsai, S.M., White, F.F., Setubal, J.C. and Santos, M., Prof. Lineu Prestes 748, Sao Paulo, SP 05508-900, Sac, Paulo, Av. Prof. Lineu Prestes 748, Sao Paulo, SP 05508-900,
da Silva,A.C.R., Ferro,J.A., Reinach,F.C., Farah,C.S., Furlan,L.R., Quaggio,R.B., Monteiro-Vitorello,C.B., Van Sluys,M.A., Almeida Jr.,N.F., Alves,L.M.C., do Amaral,A.M., Bertchini,M.C., Camarotte,G., Cannavan,F., Cardozo,J., Chapina,L.P., Cicapina,F.P., Cicapina,L.P., Cicapina,F.P., Cicapina,D.P., Cicapina,B.B., Ferreira,A.J.S., Ferreira,R.C.C., Ferro,M.I.T., Formighieri,E.F., Franco,M.C., Gruber,A., Katsuyama,A.M., Kishi,L.T., Leate Jr., R.P., Lemos, E.G.M., Lemos,M.V.F., Locali,E.C., Machado,M.A., Machina,R.B.N., Martinez-Rossi,N.M., Martins,E.C., Maidanis,J., Menck,C.F.M., Miyaki,C.Y., Moon,D.H., Moreira,L.M., Novo,M.T.M., Okura,Y.K., Oliveira,M.C., Oliveira,M.C., Oliveira,M.C., Oliveira,M.C., Oliveira,M.C., Oliveira,M.C., Oliveira,M.C., Tezza,R.F., Spinola,L.A.F., Takita,M.A., Tamura,R.E., Teixeira,E.F., Setubaj,J.C. and Kitajima,J.P.
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AGGISLPAAAALAAEPPVASDIRVDGLQRIASGTVFTYLPVNRCDTVDDGKVADSIRAL
YRGFFEDVQLDRQVNLVTVERPAJINKLTVYGKDIKSEBLLKGLGDIGLTBGGT
FDRLSLDRVTQELTRQYNNRGKYNVEITPTVSPDRNKYDVALAIKEGKAAKIRHVNL
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DSTQVSISPDKRDMFVSAGVTEGEQYKISEIKVTGDTVLPQADIERLVIPKAGDIFSR
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NSRTSDEVLRREMRQFENTWYSQAAIDRSKIRLORLGYFESVDVETPAVPGSNDQVDV
VYNVKETTSGSFVFGLGFSQAFGVTTSVQLSQNNFLGGGNRVAVEASRSTFQQRYAFS
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Comparison of the genomes of two Xanthomonas pathogens with
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/protein_id="AAM40663.1"
/db_xref="GI:21112425"
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complement(72, .2528)
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Nature 417 (6887), 459-463 (2002)
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/db_xref="ATCC:33913"
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/transl_table=11
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/translation="waSTAMHSEPSAAAVPRHLAIIMDGNGRWAQRRRRPRVIGHRAG
ARANNRTIDECLDKGVSALTLEAFSSENWGRODEVDALMKETHALDGKGEELDGRG
VONRFIGDRSRFTPALENBRWGERITAANTRLVLSIAASYGGRODIAMAARLIAVE
AAGRLQPEQIDEALLASRVALADLPAPDLFIRTGGDTRISNFILMOLAYTELMFTETL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /translation-"MSELSYRRILLKLSGEALMGDGDYGIDPKVINRLAHEVIEAQQAGAVALVIGGGNIFRGAGLAASGMDRYTGDHMGMLATVINALAMQDALEKLGAKVRVM
SARKINDVOEDFIRRRAIRHLEKGRIAIFAAGTGNPFFTTDSGAALRAIEIGABLLLK
ATKVDGVYDKDPKREDAVRUDSLIYDEVIMGGLEVMDTAAFALARDSDLPLRIFGMS
EPGVLLRILHGAQIGTLVQGRS"
                                                                                                                                                                                                                                                                           /translation="mingirodaotrwtksidalrhslitvrtgraspalldnikvka
ygtdtpliouvasisvsegrslivisledkgmikdvekaiyasdlgltptvvgtvirlinl
pplteerrkelsksvhgegedakvairnirrdanoqvkdlikdkovytedeargaeddi
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located using Blastx/Glimmer/Genemark"
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/note="identified by sequence similarity; putative; '
located using Blastx/Glimmer/Genemark"
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located using Blastx/Glimmer/Genemark"
                                                               WPEFDAGVLQQALDDYAGRERRFGLTSAQIAEKATEASSA"
complement(6694. .7251)
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                                                                                                                                                                                                                             /product-"ribosome recycling factor"
/protein_id="AAM40668.1"
/db_xref-"GI:21112430"
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Pred. No. 3.2e-24;
0; Mismatches 439;
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/product="uridylate kinase"
/protein_id="AAM40669.1"
/db_xref="G1:21112431"
                                                                                                                                                                                                                                                                                                                               QKLTDKAIKDVDEVVKGKEQELMTV" COMplement(7488. .8210)
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complement(8318. .8983)
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/transl_table=11
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/note="XCC1371"
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ilarity 57.2%;
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                                                                                                                4238 AGCGCGTCGAGTCCGGCGTCGGCGCCTGGATCTGCTGCAAGGCCGGCTGGACTTCG
353 CGCTGGCGCTCGCCAACAAGGAAAGCCTCGTGACGGCAGGGCAACTCCTGATGCGGACG
                       4598 GCCTGCGCTCCTGCGACGCCAGCCGCGGGGTGCGGGGGTGATCCTGACCGCCTCCGGCG
                                                                                                                                                                                                                                                                                                                                                                                                                                                  650 AGGCGCTCGAGCTGATCGAGACGCGCGAATTCTTCGGCTTCGAGCCGGACCGGATCGAGG
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                                                                                                                                                                             473 CGCTG---GCGGGCGAGGACACGGCCTGCGTCGAGCGCGTCATCATCACGCGGCGCGCG
                                                                                                                                                                                                                                                                      GGCCGTTCCGCGACTGGAGCCTCGAGCGCATCCGCGCCTGCACCGTGGCCGAGGCGCAGG
                                                                                                                                                                                                                                                                                                                                                           590 CCCATCCCAACTGGTCCATGGGCCAGCGGATCTCCATCGACAGCGCCTCGATGTTCAACA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1010 CCGGACGCATCGGGTTTCTGGACATGGCGGCGGTGGTCGAGGAGGCGT 1058
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Altincicek, B., Jomaa, H. and Beck, E. Direct Submission
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Altincicek, B., Hintz, M.,
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Qy 662 TGATCGAGACGCGCAATTCTTCGACCTTCGAGCCGGACCGGATCGAGCCGTCCTC 721 111111111111111111111111111111111111	Db 989 cgGCCargCrGaArGCGCGAACGAGGGGCGGGGCGCGCATTCTCGAGGGGCGCACATCC 1048 Qy 1022 GGTTCTGGACATGGCGGGGGGGGGGGGGGGGCGCGGGGGGGTTCG 1071	RESULT 11 AE004785/c LOCUS AE004785 14537 bp DNA linear BCT 30-AUG-2000 DEFINITION Pseudomonas aeruginosa PA01, section 346 of 529 of the complete ACCESSION AE004785 AE004091 VERSION AE004785 1 GI:9949809	NETWOKIS SOURCE Pseudomonas aeruginosa ORGANISM Pseudomonas aeruginosa Bacteria; Proteobacteria; gamma subdivision; Pseudomonadaceae; Pseudomonas	REFERENCE 1 (bases 1 to 14537) AUTHORS Stover,C.K., Pham,X.Q., Erwin,A.L., Mizoguchi,S.D., Warrener,P., Hickey,M.J., Brinkman,F.S., Hufnagle,W.O., Kowalik,D.J., Lagrou,M., Garber,R.L., Goltry,L., Tolentino,E., Westbrock-Wadman,S., Yuan,Y., Brody,L.L., Coulter,S.N., Folger K.R., Kas,A., Larbig,K., Lim,R., Smith,K., Spencer,D., Wong,G.K., Wu,Z. and Paulsen,I.T. TITLE Complete genome sequence of Pseudomonas aeruginosa PA01, an	OPPORTUDISTIC Parnogen JOURNAL Nature 406 (6799), 959-964 (2000) MEDLINE 20437337 PUBMED 10984043 REFERENCE 2 (bases 1 to 14537) AUTHORS Stover,C.K., Pham,XQ.T., Erwin,A.L., Mizoguchi,S.D., Warrener,P., Lagrou,M.J., Brinkman,F.S.L., Hufnagle,W.O., Kowalik,D.J., Lagrou,M., Garber,R.L., Goltry,L., Tolentino,E.,	Westbrook-Wadman, S., Yuan, Y., Brody, L.L., Coulter, S.N., Folger, K.R., Kas, A., Larbig, K., Lim, R.M., Smith, K.A., Spencer, D.H., Wong, G.KS., Wu, Z., Paulsen, I.T., Reizer, J., Saier, M.H., Hancock, R.E.W., Lory, S. and Olson, M.V. TITLE Direct Submission JOURNAL Submitted (16-MAY-2000) Department of Medicine and Genetics, University of Washington Genome Center, University Of Washington, Box 352145, Seattle, WA 98195, USA	e rce
Friedrichstr. 24, Glessen 35392, Germany Friedrichstr. 24, Glessen 35392, Germany Location/Qualifiers 1. 1191 Corganism="Pseudomonas aeruginosa" /db_xref="taxon:287" Lill91 /function="biosynthesis of isopentenyl diphosphate, IPP" /ronge="bxp reductoisomerase; Dxr" /ronge="bxp reductoisomerase; Dxr" /rong="bxp reductoisomerase; Dxr" /rong="bxp reductoisomerase; Dxr" /rong="bxp reductoisomerase; Dxr" /rong="cologo" /rong="c	BASE COUNT 176 a 400 c 413 g 202 t ORIGIN 24.2%; Score 286; DB 1; Length 1191; Query Match 24.2%; Pred: No. 1.9e-23; No. 1.9e-23; Matches 597; Conservative 0; Mismatches 455; Indels 18; Gaps 2;	QY 20 TTGGGGCCACCGGCTCCATCGGCGAATCCACCTTCGACTCGTCATGCGGAAGGCG 76 1 <td>OY 137 AAATGGGGGGTGGGTGAAGGCGGAGCTTGCCGTCACCGCGATGAGGACTGCCTGC</td> <td>QY 197 CGCTGCGCGAGGCGCTGGCGGCACGGGCAGGTCGCGGGGGGGG</td> <td>QY 317 TCGTGCCCGGAATGCGGCGCTGAAGCAGCGCCCCCCCCCC</td> <td>QY 437 IGCCGGTGGACAGCGACTCCGCGGTCTTTCAGGCGCTGGCGG 481 IIIII IIIIIIIII IIII III /td> <td>Oy 542 ACTGGAGCCTCGAGCGCTGCCCAGCCGAGCCCATCCCAACT 601 b 1 1 1 1 1 1 1 1 1 1 </td>	OY 137 AAATGGGGGGTGGGTGAAGGCGGAGCTTGCCGTCACCGCGATGAGGACTGCCTGC	QY 197 CGCTGCGCGAGGCGCTGGCGGCACGGGCAGGTCGCGGGGGGGG	QY 317 TCGTGCCCGGAATGCGGCGCTGAAGCAGCGCCCCCCCCCC	QY 437 IGCCGGTGGACAGCGACTCCGCGGTCTTTCAGGCGCTGGCGG 481 IIIII IIIIIIIII IIII III Oy 542 ACTGGAGCCTCGAGCGCTGCCCAGCCGAGCCCATCCCAACT 601 b 1 1 1 1 1 1 1 1 1 1	

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/gene="cdsA"
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/gene="upps"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complement(1444. .2634)
/gene="dxr"
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/gene="cdsA"
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/gene="upps"
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                                                                                                                       /db_xref="GI:9949810
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/transl_table=11
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/transl_table=11
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                                        /transl_table=11
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/note="PA3650"
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                 /codon_start=1
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; ; 2367 2187 2547 2487 2427 2307 2127 2007 TGCCGTCGACCCTGGCGGCCGTCGAGGCCGGCAACGCGCTACTGCTGGCCAACAAGAGG 2247 rearceasecerecrescretresacececaseceasecaseresaseresisarecaec 1887 316 541 GGCCCGAGGCGTTCCGCACCGTCGTCGCTCTGACCGGCGGCGCAACATCCGGCGACTGGCCC 136 256 376 436 601 661 721 781 841 Gaps 2486 TCAGGCACCGCCCCTCTATGCGGTGGTGCCGGAGCAGGCCGCGGGGATTGCCTTGCAGG GTTACGAAGCCTTCGCCCTGACTGGCTTCAGCCGCCTGGCCGGAACTCGAGGCGCTGTGCC GCTCGCTCGCCGCGCGGGTATCCGCACCCGGGTGCTGTTCGGCGAGCCAGGCGTTGTGCG CCGAGGCCGCCGACCGGCCGACTGGACCATGTCGGCCCATCGTGGGCCCCGCGGGGCC AAGTGGCCAGCGCCCCGAAGTGGACATGGTAATGGCGGCCCATCGTCGCCGCCCCCGGGC TCGTGCCCGGAATGCGGGCGCTGAAGCACGGCCGCACGCTGGCGCTCGCCAACAAGGAAA GCGAGGACACGGCCTGCGTCGAGCGCGTCATCACGGCGTCCGGCGGGCCGTTCCGCG ACTGGAGCCTCGAGCGCATCCGCGCCTGCACCGTGGCCGAGGCGCAGGCCCATCCCAACT GGTCGATGGGGCGTAAGATTTCCGTCGACTCCGCCAGCATGAACAAGGGGCTCGAAC TGATCGAGACGCGCGAATTCTTCGGCTTCGAGCCGGACCGGATCGAGGCGGTCGTCCATC CGCAATCCATCGTCCATGCGATGGTGGCCTTCTGCGACGGGGGCCTGATGCCCATCTCG GCCCCGCCGACATGCGCCACGCCATCGGATTCGCGCTGAACTGGCCGGGTCGCGGGCGAGG GCCTCGTGACGGCAGGGCAACTCCTGATGCGGACGGCCCAGGAGAACGGCGCCACGATCC GGTCCATGGGCCAGCGGATCTCCATCGACAGCGCCTCGATGTTCAACAAGGCGCTCGAGC 18; TTGGGGCCACCGGCTCCATCGGCGAATCCACCTTCGACCTCGTCATGCGGAAGGGCG Length 14537; Indels 0; Mismatches 455; TGCCGGTGGACAGCGACTCCGCGGTCTTTCAGGCGCTGGCG Score 286; DB 1; Pred. No. 9.4e-24; ch 24.2%; il Similarity 55.8%; 597; Conservative Query Match Best Local Matches 59 2606 2546 2426 2306 2246 2186 2126 2066 2006 1946 9881 20 11 137 482 782 197 257 2366 317 377 437 542 602 662 722 qq qq Dp õ 셤 g g g g q 셤 g g ŏ ò δ Óγ ò δ ò Qγ ò Ω ò οy ŏ

BCT 12-MAY-2002 prolyl tRNA synthetase; regulatory protein; secreted sugar hydrolase; sugar hydrolase; transcriptional regulator; transcriptional termination/antitermination factor; translation initiation factor IF-2; transport system integral membrane protein; two-component system response regulator; two-component system AL355913.2 GI:20520782 1-deoxy-D-xylulose 5-phosphate reductoisomerase; acyl CoA dehydrogenase; aldehyde dehydrogenase; ATP/GTP binding protein; , beta-galactosidase; cytidine deaminase; gcpE; glycosyl transferase; integral membrane protein; kinase; lipoprotein; metalloprotease; project, in codons is given for each CDS.
Usually the highest scoring match found by fasta -o is given for CDS which show significant similarity to other CDS in the database. The position of possible ribosome binding site sequences are given Actinomycetales; Streptomycineae; Streptomycetaceae; Streptomyces. 1 (bases 1 to 39744) The more significant matches with motifs in the PROSITE database are also included but some of these may be fortuitous. The length Centre is funded (first CDS), c (complementary map Gerdeno, A. M., Parkhill, J., Barrell, B.G. and Rajandream, M.A. Cerdeno, A. M., Parkhill, J., Barrell, B.G. and Rajandream, M.A. Direct Submission
Submitted (11-MAY-2000). Streptomyces coelicolor sequencing projesanger Centre, Wellcome Trust Genome Campus, Hinxton, Cambridge CB10 ISA E-mail: barrell@sanger.ac.uk Cosmids supplied by Prof. David A. Hopwood, [3] John Innes Centre, Norwich, Research Park, Colney, Norwich, NorTolk NH4 70H; UK
On May 9, 2002 this sequence version replaced gi:7801248. 1646 CGGCCATGCTGAATGCCGCGAACGAGGTGGCCGTGGCCGCATTTCTCGAGCGGCACATCC 1587 Redenbach, M., Kieser, H.M., Denapaite, D., Eichner, A., Cullum, J., Kinashi, H. and Hopwood, D.A. 961 Streptomyces coelicolor sequencing at The Sanger Centre is fun by the BBSRC and Beowulf Genomics
Details of S. coelicolor sequencing at the Sanger Centre are available on the World Wide Web.

(URL, http://www.sanger.ac.uk/Projects/S_coelicolor/) CDS are physical 842 TGCCCGTCGCCCGGATCGACCTCGCACAGATTGCGAGCCTCACCTTCCAGAAGCCTGACG Bacteria; Firmicutes; Actinobacteria; Actinobacteridae; set of ordered cosmids and a detailed genetic and plot the 8 Mb Streptomyces coelicolor A3(2) chromosome ol. Microbiol. 21 (1), 77-96 (1996) GGTTTCTGGACATGGCGGCGGTGGTCGAGGACGCTCGCGGGCGTTTCG 1071 SC7B7.01c. SC linear DNA numbered using the following system eg coelicolor), 787 (cosmid name), .01 (f. 5H4. SC5H4 39744 bp Streptomyces coelicolor cosmid 5 AL355913 AL645882 AL355913.2 GI:20520782 Streptomyces coelicolor A3(2) Streptomyces coelicolor A3(2) 2 (bases 1 to 39744) Murphy, L. and Harris, D. sensor kinase. Unpublished Mol. Micr 97000351 8843436 strand) Notes Ø DEFINITION ACCESSION VERSION SOURCE ORGANISM 1022 MEDLINE PUBMED TITLE JOURNAL 1706 962 902 1586 AUTHORS REFERENCE REFERENCE AUTHORS JOURNAL REFERENCE AUTHORS RESULT 12 JOURNAL KEYWORDS TITLE COMMENT SC5H4 LOCUS ŏ qq Q d Qγ g οy g

where these have been used to deduce the initiation codon. Gene

1826

Db

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prediction is based on positional base preference in codons using a specially developed Hidden Markov Model (Krogh et al., Nucleic Acids Research, 22(22):4768-4778(1994)) and the FramePlot program of Bibb et al., Gene 30:157-66(1984) as implemented at http://www.nih.go.jp/
jun/cgi-bin/frameplot.pl. CAUTION: We may not have predicted the correct initiation codon. Where possible we choose an initiation
                                                                                                                                                                                                                                                                                        jun/cgi-bin/framepiot.pl. CAUTION: We may not have predicted the correct initiation codon. Where possible we choose an initiation codon (atg, gtg, ttg or (att)) which is preceded by an upstream ribosome binding site sequence (optimally 5-13bp before the initiation codon). If this cannot be identified we choose the most upstream initiation codon and the codon codon. The codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon codon 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            complement(2. .136)
/note="nominal overlap with Streptomyces coelicolor cosmid
SC8B7"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note="SC5H4.02, possible regulatory protein, len: 552 aa; similar to TR:09ZBPO (EMBL:AL034492) Streptomyces coclicolor putative regulatory protein SC655.05c, 569 aa; fasta scores: opt: 310 z score: 323.3 E(): 1.5e-10; 30.0% identity in 587 aa overlap"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /product="putative regulatory protein"
/protein_id="CAB91114.1"
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/db_xref="SPPREMBL:09KYT7"
/db_xref="SPPREMBL:09KYT7"
/translation="MPPTLASLVHHSALKLTVRAGEDRLDVPVRWAHVSELADPVPYM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EGGELLLITALKLDAEDPEAMRRYVKRLAGAGVVGLGFAVGVNYDDVPFALVDAARQE
GLPLLEVPRRTPFLAISKAVSAAIAADQYRAVTAGFAAQRELTRRTLTDGPEGLLAAL
AAQVDGWAALYDASGAVVASAPEWAGRRAARLTADVQRLRERPAPASSVVGGAGNTGH
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GLRIDAAVLRMLLAGEPDHARTVAGDLYGGLLDAPFRVIVAESGAARNRGPTAAHTAA
GTGGDPGGDPLGTLGSLAEAAESAAARAGEAVLAVPDGERLVVLATDGGAAVAACVEH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    //note="SC5H4.03, probable aldehyde dehydrogenase, len: 481 aa; similar to TR:066573 (EMBL:AE000677) Aquifex aeolicus adichyde dehydrogenase AldH1, 476 aa; fasta scores: opt: 1129 z-score: 1260.2 E(): 0; 39.9% identity in 471 aa overlap and to SW:GAPN_STRMU (EMBL:L38521) Streptococcus mutans NADP-dependent glyceraldehyde-3-phosphate opt: 893 z-score: 997.5 E(): 0; 35.4% identity in 477 aa overlap. Contains Pfam match to entry PF00171 aldedh, Aldehyde dehydrogenase family"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ASALEAARPAAEPLAGGDEESLVVGVSAPSGPIAASAAYKQAQQALSVARRRGRVCVE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               HEHVAAGSVLPLLADDAVRAFADGLLRALRDHDATGRGDLVASVRAWLSRHGQWDAAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                sequenced clone. It may be shorter because we only sequence overlapping sections once, or longer, because we arrange for a small overlap between neighbouring submissions. Cosmid 5H4 Lies between and overlaps cosmids 8B7 and 9F2 on the AseI-B genomic restriction fragment.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       'note="nominal overlap with cosmid St5H4 from 1 to 148"
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3021. .4466
/gene="SC544.03"
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/protein_id="CAB91115.1"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1219. .2877
/gene="SC5H4.02"
/note="SCO5678"
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/gene="SC5H4.03"
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3021. .4466
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CDS

FEATURES

CDS

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complement(4476. .4889)

//gene="SC5H4.04c, probable cytidine deaminase, len: 137

//note="SC5H4.04c, probable cytidine deaminase, len: 137

as; similar to TR:053367 (EMBL.AL021841) Mycobacterium

tuberculosis cytidine deaminase Cdd, 133 aa; fasta scores:
opt 185 z-score: 244.6 E(): 3; 6e-06; 37.4% identity in 115

aa overlap and to SN:CDD MOUSE (EMBL:AA38666) Mus

musculus cytidine deaminase (EC 3:5.4.5) Cdd, 146 aa;
fasta scores: opt: 173 z-score: 229.1 E(): 2.6e-05; 29.2%
identity in 113 aa overlap. Cytidine and deoxycytidylate

deaminase zing-binding region and match to Prosite entry
                                                                                                                                                                                                              TFSNYQGGOSCISVQRVIADAAVYDRLLPŘIVAAVEAQVTGDPNDDATDVGPLVSEAA
AERVEAWVREAVDAGAKLLTGGKRDGASYÅPTVLTELPADTTLAHEEVFGPVLSVQRV
TGEAEAFAAVNDSKYGLQAGVFTHDLQAAFRAHRALEVGGVVIGDIPSYRADQMPYGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              /product="putative cytidine deaminase"
/protein_id="CaB91116.1"
/db_xref="Ca1:7801252"
/db_xref="SPTREMBL:09KYT5"
/translation="MYSQTNPVDHELIEAÀAHVARTRCRGDNHTMAAAARARIGRIVT
AVNAYHFTGGPCAELVVVGAAAAQGVYELETIVAVGDRERGVVPPCGRCRQVLDYFP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /gene="SC5H4.04c"
/note="Pfam match to entry PF00383 dCMP_cyt_deam, Cytidine
and deoxycytidylate deaminase zinc-binding region, score
/db_xref="SPTREMBL:Q9KYT6" |
/translation="MTSTHAFWLAGRQAAGESGFDVTSPWDGTTVGTVSLPTDAQVEE
                                                                                                                RAVSVFRFAAEEARRFNGGEAQRLDTDAGGQGRLALTRRFPKGVVLGIAPFNFPLNC
AHKIAPAIAAGAPLILKPAPATPLSGLILGELLAETDLPAGSWSILPVPNDKMPALVQ
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AGTRTARLVPGVDTGTFHPAADGTRVRTRÝGLGHRPVILCAARLVPRKGQDTLIRALP
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MPCRTRKGGLELEGLGIVYLEAAASGLPVVAGDSGGAPDAVREGETGHVVDGRSVAAT
                                                                                                                                                                                     DERLPVISFTGSETVGYAIMDSVPRKHCTLELGGNGAAVVLADWASDEDLDRAATRIA
                                                                        AVAAAYAVRDEFAATPAHVRAAALDHVGRRLAERTEEIARLISAENGKPVKWARGEVG
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 complement(4915. .6090)
/gene="SC5H4.05c"
/note="SC5H4.05c, possible glycosyl transferase, len: 391
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                                                                                                                                                                                                                                                                                                                                                                                                    /note="Pfam match to entry PF00171 aldedh, Aldehyde dehydrogenase family, score 357.30, E-value 1.6e-103" complement(4476. .4889)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PS00903 Cytidine and deoxycytidylate deaminases zinc-binding region signature
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/protein_id="CAB91117.1"
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complement(4575. .4820)
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complement(4915. .6090)
/gene="SC5H4.05c"
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/db_xref="SPTREMBL:Q9KYT4"
                                                                                                                                                                                                                                                                                                                                                                                                /gene="SC5H4.03"
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                                                                                                                                              24831 CAACCCGGACCGCTTCCGGGTCACCGCCTGTCCGCCAACGGCGGCCGGGTCGCCTC-- 24888
                                                                                                                                                                                            ------GGCCGGGACGGGCACCGA 230
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                                                                                                                                                                                                                                                                                             CACGCTGGCGCTCGCCAACAAGGAAAGCCTCGTGACGGCAGGGCAACTCCTGATGCGGAC 410
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                                                                                                                 831 TCGCGGCGAGGTGCCCGTCGCCCGGATCGACCTCGCACAGATTGCGAGCCTCACCTTCCA 890
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                                                          CCTGTCGATCTTTGGGGCCACCGGCTCCATCGGCGAATCCACCTTCGACCTCGTCATGCG
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    Length 39744;
                                Indels
   DB 1;
Score 278.6; DB 1
Pred. No. 4.7e-23;
0; Mismatches 444
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tch 23.6%; al Similarity 56.1%; 602; Conservative
Query Match
Best Local
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Matches
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                                                                             linear BCT 29-MAY-2002 section 151 of 469 of
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SP 05508-900,
                                                                                                                                                                                                                                                                                                                               Xanthomonas axonopodis pv. citri str. 306.
Xanthomonas axonopodis pv. citri str. 306
Bacteria; Proteobacteria; gamma subdivision; Xanthomonas group;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Comparison of the genomes of two Xanthomonas pathogens with
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Sao Paulo, Av. Prof. Lineu Prestes 748, Sao Paulo,
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                                                                             AE011773 10242 bp DNA
Xanthomonas axonopodis pv. citri str. 306,
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Submitted (28-NOV-2001) Departmento
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Nature 417 (6887), 459-463 (2002)
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/note="putative; (
/codon_start=1
/transl_table=11
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/gene="XAC1412"
95. .286
                                                                                                                                                                                                                                                     AE011773.1 GI:21107580
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Xanthomonas.
1 (bases 1 to 10242)
                                                                                                                                                                   the complete genome. AE011773 AE008923
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RESULT 13
AE011773/c
LOCUS
                                                                                                                    DEFINITION
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AUTHORS
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KEYWORDS
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QVRFIGDRSRFAAPLRDRMAGAERSTAANSRLVLSIAASYGGRODIASAARALAEDVA
AGRLQPEQIDEALLSSRVALADLPAPDLFIRTGGDTRISNFLLWQLAYTELWFTETLW
PEFDAGVLQQALDDYAGRERRFGLTSAQIADKATESSSA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /translation="MLTQIKQDAQTRMTKSIDALRHSLTTIRTGRASPALLDGIKVKA
YGADTPLNQVASISVSEGRSLVISLFDKGMIKDVEKAIYASDLGLTPTVVGTVIRLNL
PPLTEERRKELSKSVHGEGEDSKVAIRNIRRDANQQVKDLLKDKAVTEDEARSAEDDI
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GAQVALVIGGGNIFRGAGLAASGMDRVTGDHMGMLATVINALAMQDALEKLGAKVRVM
                                                                                                                                                                                                                                                                                                                                                    FAGRAFGKHKLAPRVSPNKTIEGLLGGLLÅGIAVACAFGWLAGLTLAHVPQLVLVSAL
AVLASVLGDLFESLLKRHAGAKDSGTLIPGHGGVLDRIDGVLAALPVFALGKEILGF"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /translation="MASPAMHPVLSAAVPRHIAIIMDGNGRWAQRRRRPRVIGHRAGA
RAVNRTIDFCLEKGVSALTLFAFSSENWGRPQDEVDALMKLFLHALDREVEELQRRGV
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KLSGIDDSLprtvLLMLNLLLMvLmvwaSaGSmvLFQIaSLvGvAwwLLALLWLRFFT
                                                                                                                                                                                                                                                                                                                            FGADHGNGQARALKLAAGTLAVLPAWAALVLLHASPDKGNLWLLTALTMVWAADSGAY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="Identified by sequence similarity; putative; ORF located using Blastx/Glimmer/Genemark" /codon_start=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note="identified by sequence similarity; putative; ORF located using Blastx/Glimmer/Genemark" /codon_start=1
                                                         /note="identified by sequence similarity; putative; ORF
located using Blastx/Glimmer/Genemark"
/codon_start=1
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located using Blastx/Glimmer/Genemark"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TCTTTGGGGCCACCGGCTCCATCGGCGAATCCACCTTCGACCTCGTCATGCGGAAGGGCG 76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /product="undecaprenyl pyrophosphate synthetase"
/protein_id="AAM36288.1"
/db_xref="G1:21107586"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 10242;
                                                                                                                                        /transl_table=11
/product="phosphatidate cytidylyltransferase"
/protein_id="AAM36287.1"
/db_xref="GI:21107585"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        recycling factor"
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Pred. No. 2.9e-20;
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/protein_id="AAM36290.1"
/db_xref="GI:21107588"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /product="ribosome recycl
/protein_id="AAM36289.1"
/db_xref="G1:21107587"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="xAC1418"
complement(6979. .7536)
/gene="frr"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                complement(6203. .6976)
/gene="upps"
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      complement(5379. .6206)
                                                                                                                                                                                                                                                                                                                                                                                                                 complement(6203. .6976)
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/gene="frr"
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/transl_table=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note="XAC1417"
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IRLORLGYPESVDVETPAVPGSNDOVDVVXNWKETTGGSFVFGLGYSGSFGYTTSVQL
SQNNFLGGGNRVAVEASRSSYQORAFSYTNPFFTDDGVSLGYNLSRRALDYSDFNTA
QFNGKNGSAQVVFGVPTENDTVSAWGIDSNQITTFRAGTTPOAIIDYINALGTRFTFH
AWRTELGWARDTRNDFFMPTRGMYQRVGLETTLPGSTVEYYKLNYQISNYWPIIPALV
                                                                                     'translation="MKTVLSIFGSVILLGAVTSASADDFAQQRTNALSFWDQQVQCVD"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SGTVFTY LPVNRGDTVDDAKVADA IRALYRTGFFEDVQLDRQGNILV 1TVK ERPATNK
LTVTGNKDIK SEELLKGLGDIGLSEGGTFDRLSLDRVTQELTRQYNNRGKYNVEITPT
VSPLDRNRVDVAIAIKEGKAAKIRHVNLIGTEKFANEDILDNWESKEHNWASWYRRDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QYSKEKMSGDLEKLINSWYLDRGYVDFSIDSTQVSISPDKRDMFISAGVTBGEQYKISE
IKVTGDTVLPQADIERLVIPKAGDIFSRALLEYTSDAITNTLSNVGYAFAKVNPIPTP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GPRSEAINGYTRGQPLGGSFKTVGSVEMYFPKLFDSPSARVSAFVDFGNVYNGVDNFK
ANELRASTGVALLWRAPVGPISISYAFPLKKEDNDEIERLQFTFGGQF"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SDASMQLTTAAMDRRDVRVLTASDTASSSEHTLRLSQLPVGFDERRVAALAGIGWQFM
LQPPVIAEVVKGSVADGLLKPGDRIVAIDGQPIRSAEDIIPQVQALGAHGGPGMIEVA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RGEDRLALEIAPRKSPQGGWMIGVRPAAAPAPEYDSRQQYGLFAAVPAAIRETGRWTA
DSLGMMKRMLTGQASVKNISGPVTIARAANASAERGLDWFLYFLGLLSLSLAIINLMP
IPILDGGHLLYYLIELIKGSPISERAMIAGQYVGLAALAGLMGLAFYNDILGLVPR"
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/protein_id-"aAm36286.1"
/db_xref-"GI:21107584"
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VAAIVGAAGLPSTLAAARAGKRLLLANKESLVLAGELLTRTAAAAGAEIIPIDSEHSA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ATLMNKGLEVIEAHHLFGLPGEQIDVLVHPQSLVHSLVEFVDGSTLAQLGLPDMRTTL
AVGLAWPERVESGVGGLDLLSQGRLDFEAPDTAAFPCLRLAWDALRAGGTAPAILNAA
NEVAVSAFLQGQVGFLAIPALVEHTLTTLQRHNADSLDTLLFADAQARQITERALAHH
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FQCLRSCDASRGVRRVILTASGGPFRGRDRAALAAVTPAQAVAHPKWSMGPKISVDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   'translation="MTRLPTRRLLALALAAGLSLPAVALAVEPFVASDIRVDGLQRIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LNTRFELGYGDSYGKDSTRVLTNPDGSTRTVTATGLPFYENFYAGGTNSVRGFEDNTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  translation="MGDFIGSVWWMIVSLGVLVTFHEFGHFWVARRCGVKVLRFSVGF"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /note="ldentified by sequence similarity; putative; ORF located using Blastx/Glimmer/Genemark" /codon_start=1 /transl_table=11
                                                                                                                                                                                                                                                                                       /note="identified by sequence similarity; putative; ORF located using Blastx/Glimmer/Genemark"
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located using Blastx/Glimmer/Genemark"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /product-"conserved hypothetical protein"
/protein_id="AaM36285.1"
/db_xref="GI:21107583"
'product-"conserved hypothetical protein"
                                                                                                                                                                                                                                                                                                                                                                                                              /product="outer membrane antigen"
/protein_id="AAM36284.1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      complement(4186. .5376)
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/gene="cdsA"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           complement(2813. .4159)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              'codon_start=1
'transl_table=11
                                                                                                                                                                             /gene="oma"
/note="XAC1413"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note="XAC1415"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /gene="XAC1414"
                                                                                                                                                                                                                                                                        gene="oma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /gene="dxr
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STGSIGTQAIDVVLRNPGRFKVVALSAAGGAVELLAEQA
ARGFGGGGAGRPLBRVLAAGDAATELAAAECHSVLNGIT
ATAKESLIVGGPLVKAVAQPGQIVPVDSEHAALFQALAG
RRTREQLAATPAALAHPTWAMGPVVT INSATLVNKGL
VHPOSVVHSMVEFVDGSTMAQASPPDMRMPIALGLGWPD
RPLDNRAFRAVELAREVGTLGGTARAVENANEECVDAF
LEGTPPQSGTSLITVEDVLHAESWARRARRELAAG"
162 t
                                                                                                                                                                                  Dairi, Toyama Prefectural University, 5180 Kurokawa, Kosugi-machi, pan (E-mail:dairi@pu-toyama.ac.jp, xx:81-766-56-2498)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ylulose 5-phosphate reductoisomerase"
.1"
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                                                    M., Kuzuyama,T., Itoh,N. and Seto,H. ion of the mevalonate pathway in a Streptomyces strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CCGGAATGCGGGCGCTGAAGCACGGCCG 350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TGACGGCAGCCAACTCCTGATGCGGAC 410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TEGACAGCAGCACTCCGCGGTCTTTCA 470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CCGCCGACCGGCCGGCCGACCAT 290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TGGCCGCGCGGAGTGCCACTCGGTGCT 293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           530
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GCGCCTGCACCGTGGCCGAGGCGCAGGC 590
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GCAAGCTGGTGGTGACCGCCAGCGGCGG 527
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CGGCCGTCACGCCGGCCGACGCGCTGGC 587
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CCATCGACAGCGCCTCGATGTTCAACAA 650
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
nobacteridae; Actinomycetales; ceae; Kitasatospora.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               7.2; DB 1; Length 1161; 1.4.1e-19; tches 353; Indels 6;
                                                                                                                                                                                                                                                                                                 ora griseola"
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/db_xref=" /note="ser complement	/gene="NMB Complement /gene="NMB /note="sim	FID:165159 sequence s /codon_sta /transl_ta	/processing/ /processing/ /db_xref="/ /translati	GOLSYGYTTP TNKERMVRIS GVPYRRLKPE HFNONISKID	SLTLPVINSD VVNDLFPEGG KLTADIVSGK COMPlement	/gene="NMB complement /gene="NMB /note="sim identity:	putative" /codon_sta /transl_ta /product=" /protein_i /db_xrefe" /translatii /TMLGYALKQA	GAVEWMWTA FALFGTFASF ASFIVPAMAV RGVFSNEAGM GGEFVKPEVS	GEKFAGLYRV GEKRAGLYRV DFKQKITNGE COMplement /gene="NMB /gene="NMB //dene="Sim //dote="Sim	/codon_sta /transl_ta /product="	Acety191uc /protein_i /db_xref="i" /translati /tra	/gene="nmB /note="sim identified /codon_sta /transl_tal /product=" /ehydratelials /potein_is /db_xref=""
aeb	CDS				əuəb	CDS			gene		gene	
Qy 651 GGCGTCGAGCTGATCGGCGGAATTCTTCGGCTTCGAGCCGGACCGGATCGAGGC 710 1 11 11 11 11 11 1 1 1 1	Qy 711 GGTCGTCCATCCGCAATCCATCGTCGGTGGTGGGCTTCTGCGACGGGGCCTGAT 770	QY 771 GGCCCATCTGGCCCGCGACATGGCCATCGGATTGGCCTGAACTGGCCGGG 830 11111 1 1 1 1 1 1 1 1 1 1	Qy 831 TCGCGGCGAGCTCCCCCGGATCGACCTCGCACATGCCAGCTCCACCTTCCA 890 DD 828 CCGGGTGCCGCCCCGGCTCGCGACTGGACCACCACCTGGGACTTCTT 887	Oy 891 GAAGCCTGACGAGGAACGCTTTCCGGCCCTGAGGCTTGCGCGAGACGTCATGGCGGCGCG 950 Db 888 CCCGCTGGACAACGCGTTCCCGGCGGTCGAGCTCGCCCGCGAGGTGGGTACGCTCGG 947	QY 951 CGGCTGTCGGCGCCCGTTCAACGCGCCAAGGATCGCGCTCGATCATTCAT	OY 1011 CGGACGCATCGGGTTTCTGGACATGGCGGCGGTGGTCGAGGACGCTCGCGG 1063	AEO02375/c AEO02375 AEO02375 AEO02375 AEO02375 AEO02375 AEO02375 ACCESSION AEO02375 AEO02375 AEO22976 AEO02375.1 GI:7225394	EXPUNCIS SOURCE ORGANISM Neisseria meningitidis MC58 ORGANISM Neisseria meningitidis MC58 ORGANISM Neisseria: Proteobacteria; beta subdivision; Neisseriaceae; Neisseria	AUTHORS Tettelin, H., Saunders, N.J., Heidelberg, J., Jeffries, A.C., Nelson, K.E., Eisen, J.A., Ketchum, K.A., Hood, D.W., Peden, J.F., Dodson, K.J., Nelson, W.C., Gwinn, M.L., DeBoy, R., Peterson, J.D., Hickey, E.K., Haft, D.H., Salzberg, S.L., White, O., Fleischmann, R.D., Dougherty, B.A., Mason, T., Clecko, A., Parksey, D.S., Blair, E., Cittone, H., Clark, B., Cotton, M.D., Utterback, T.R., Khouri, H.,	Plaza, M., Grandi, G., Sun, L., Smith, H.O., Fraser, C.M., Moxon, E.R., Rappuoli, R. and Venter, J.C. TITLE Complete genome sequence of Neisseria meningitidis serogroup B	5 " RIC & T F F F F F 7 7	Qin, H., Vamathevan, J., Gill, J., Scarlato, V., Masignani, V., Pizza, M., Grandi, G., Sun, L., Smith, H.O., Fraser, C.M., Moxon, E.R., Rappuoli, R. and Venter, J.C. TITLE Direct Submission JOURNAL Submitted (17-MAR-2000) The Institute for Genomic Research, 9712 Medical Center Dr, Rockville, MD 20850, USA Medical Location/Qualifiers Source Location/Qualifiers //strain="Neisseria meningitidis MC58"

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rt(121. .1377)
B00176"
milar to GB:L02948 SP:P29011 PID:145703 GB:U00096
F191 percent identity: 76.98; identified by
similarity; putative"
                                                                                                                                                                                                                                                                                                                                                                                        Lion-"MKVLVLGAGVAGVSSAWYLAEAGHEVTVIDRAEGVAMETSFANA
TEWAAPGIPTKALKWLFKSIPPLLFRPDGSLYQIEWLWOMLONTAAHYO
ISEYSREMFRFEAOTGMNEGRKKGTLQIFROTKEVEAAKODIAVLERY
PEECAEFEPALAKYTAKIAGGIHLPADATGCRETTBULYKCOEKGVRF
IDHNGLRIKTVETETGRFEADAVYCALGCFSRTVLAQLDLNLPIYPVKGY
SGOLSOAFWSGLRPWTPDNRIRKGGMAELSGYRETLAL
SGOLSOAFWSGLRPWTPDSTPLIGRTRFDNLFLNTGHGTLGWTWSLGSA
STOTEIRSDDLSLSRYQA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SFGIGSSVQSNSVAQAVQTSFGIEPAYTGITLTVLTAVVVLGGIKGIKKA
VFYVLGGLSIIAINSDALMPAYKLIFSDAFSAQAVAGGAIGTVIRYGVA
BMGSAPIAAAAATDHPVRQALVSMTGTFLDTIVVCSITGIVLWGLLGA
SGGAALITTYFQKKLPGIGGWIVTIGLIFFAYSTILGRCYYGBKCAVYVF
VGYVSSVWLGTVLSLDLVWLASDTFNGLMALPNLIALLLMAKVIVNETR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ion="Wilhptaviddraeldsgukugaytvigpnvoiganteigpha
Ennripofasigeipodkkyndeptkliigngntirepttpnlgtyvig
Maimaychlahovignhtifannaslaghytigdyvuggytuvpgpcr
Aagukkuyppypermasgyraebaginsegmrngftaeoisavkdykyt
Aagukkuyppypeasgyraebaginsegmrngftaeoisavkdykyt
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"GI:7225398"
ion="mdVQLPIEAKDIQKLIPHRYPFLQLDRITAFEPWKTLTAIKNVT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AFMPPKKHKSGEGHEGDISHFAALMTALSATIGTGNIAGVATAVVTGĞP
AIFGMATKYGEGVLAVKYRVŅNSKGEMSGGPMYYIEKGLGKNWKWMAVA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ion="MOVFLDNPKAFFETVSGWVWGPLMLMLLVGTGILLTVLLKGLQF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         milar to PID:1718489 percent identity: 100.00; ed by sequence similarity; putative"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  milar to PID:1718488 percent identity: 100.00; dby sequence similarity; putative"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               "(3R)-hydroxymyristoy|-(acyl carrier protein)
                                                                                                                                                                                                                                                                                             "D-amino acid dehydrogenase, small subunit"
id="AAF40633.1"
"GI:7225395"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 milar to GB:AE000511|PID:2314080 percent 69.11; identified by sequence similarity;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        "sodium/alanine symporter, putative"
id="AAF40634.1"
"G1:7225396"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     "acyl-(acyl-carrier-protein)--UDP-N-cosamine O-acyltransferase"
id="AAF40635.1"
                             erogroup: B"
nt(121, 1377)
MB0176"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              11(4067. .4516)
"taxon:122586"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               t(1456. .2847)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               t(3204. .3980)
B0178"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tt(3204. .3980)
B0178"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        t(4067. .4516)
                                                                                                                                                                                                                                                                                 able=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    able-11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    able-11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          able=11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ELPH"
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/translation="MHTLLAFIFAILILVSLHEFGHYIVARLCGVKVVRFSVGFGKPF

gene

CDS

gene

CDS

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RGAMSDTTVGNGTKIDNQVQIGHNCKIGSHTVIAAKTGISGSVTIGSYCIIGGGVGTV
GHIEIADKTTIGGGTSVTHSITESGKHLAGIFPMSTHKEWARNAVYIHRLSEMNKRLK
INEPQFQGHFPDLPVMPGVLIIEAMAQACGTLAILSEGGRKENEFFFFAGIDEARFKR
QVIPGDQLVFEVELLISSRRGIGKFNAVAKVDGQVAVEAIIMCAKRVV"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   /translation="MTRLTRAFAAALIGLCCTAGAHADTFQKIGFINTERIYLESKQA
RKIQKTLDSEFSARQDELQKLQREGLDLERQLAEGKLRNAKKAQAEEKWRGLVAAFRK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RVDIDITIDEGKSAKITDIEFEGNOVYSDRKLMROMSLTEGGIWTWITRSNOFNEGKF
AODMEKVIDEFONNGYTDFRILDTDIOTNEDKTRYOTIKITHVBEGREFRWKTKSYEBEDT
NEVERAELBEKLLTWREFRWYBROOMTAVLGETONRMGSAGYAYSEISYOPLPANETKT
VDFVLHIEPGRKIYVNEIHITGNNKTRDEVVRRELROMESAPYDTSKLORSKERVELL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GNKKANVSAELLFPMPGAKDARTVRLSLFADAGSVWDGKTYDDNSSSATGGRVQNIYG
AGNTHKSTFTNELRYSAGGAVTWLSPLGPMKFSYAYPLKKKPEDEIQRFQFQLGTTF"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /translation="MIPATYTLSQITARLGGEWRGEDISVTAVRPLADAQAEHISFLA
NPKYKAEVHDSSAGAVIVSAKAADGFEGRNLIVADDPYLYFAKVARLFSPVVKARGGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    HPTAVVEPGATVPTSCEIGANVYIGANTVLGEGCRILANAVVQHDCKLGDEVVLHPNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KQAQFEEDYNLRRNEEFASLQQNANRVIVKIAKQEGYDVILQNVIYVNTQYDVTDSVI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LPVKVGDTYNDTHGSAIIKSLYATGFPDDVRVETADGQLLLTVIERPTIGSLNITGAK
MLQNDAIKKNLESFGLAQSQYFNQATLNQAVAGLKEEYLGRGKLNIQITPKVTKLARN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FTAGAGIRMSVPVTEYDRVNFGLVAEHLTVNTYNKAPKHYADFIKKYGKTDGTDGSFK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GWLYKGTVGWGRNKTDSALWPTRGYLTGVNAEIALPGSKLQYYSATHNQTWFFPLSKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FTLMLGGEVGIAGGYGRTKEIPFFENFYGGGLGSVRGYESGTLGPKVYDEYGEKISYG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GYFDNVQFDAYPLAGTPDKVDLNMSLTERSTGSLDLSAGWVQDTGLVMSAGVSQDNLF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /translation="MKLKQIASALMMLGISPLALADFTIQDIRVEGLQRTEPSTVFNY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GTGKSAALRASRSKTTLNGSLSFTDPYFTADGVSLGYDVYGKAFDPRKASTSIKQYKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /note="similar to GB:M34854 SP:P31519 PID:155479 percent identity: 46.88; identified by sequence similarity;
                                                                                                                                                                                                         /note="similar to PID:1718487 percent identity: 100.00; identified by sequence similarity; putative"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 percent identity: 99.87;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /note="conserved hypothetical protein; identified by
                                                                                                                                                                                                                                                                                                                                              /product="UDP-3-0-(3-hydroxymyristoy1)-glucosamine
Nacyltransferase"
/protein_id="ARM40637.1"
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/protein_id="AAF40638.1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             identified by sequence similarity; putative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /product="conserved hypothetical protein"
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      /product="outer membrane protein Omp85"
/protein_id="AAF40639.1"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note="similar to GP:2460281
                                                                                                    /gene="NMB0180"
complement(4550. .5596)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             complement(5629. .6129)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     complement(6195. .8588)
/gene="NMB0182"
                                                                complement(4550. .5596)
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complement(8645. .9985)
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/trans1_table=11
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/transl_table=11
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PVLDGGHLVFYTAEWIRGKPLGERVQNIGLRFGLALMMLMMAVAFFNDVTRLLG"
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FTRKRGDTEWCLAPIPLGGYVKMVDTREGEVSEADLPYAFDKQHPAKRIAIVAAGPLT
NLALAVLLYGLSFSFGVTELRPYVGTVEPDTIAARAGFQSGDKIQSVNGTPVADMGSA
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GGVEKGSPAEKAGLKPGDRLTAADGKPIASWQEWANLTRQSPGKKITLNYERAGQTHT
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Pred. No. 2.16
                                                                                                      complement(10020, .11204)
/gene="NMB0184"
complement(10020, .11204)
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Search completed: April 22, 2003, 03:12:18 Job time : 4558 secs

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OTHER INFORMATION: "n" bases
OTHER INFORMATION: represent
Similarity
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LENGTH: 4403765
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                                                           April 22, 2003, 02:01:34 ; Search time 65 Seconds
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/cgn2_6/ptodata/1/ina/5B_COMB.seq:*
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Compugen Ltd.
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US-09-480-921B-9
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Listing first 45 summaries
                                         nucleic search, using sw model
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       GenCore
Copyright (c) 1993
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APPLICANT: FASSER, Claire M.
APPLICANT: FASSER, Claire M.
APPLICANT: VENSER, Claire M.
APPLICANT: VENTER, Claire M.
TITLE OF INVENTION: TUBERCULOSIS
FILE REFERENCE: 24366-20007.00
CURRENT APPLICATION NUMBER: US/09/103,840A
SOURRENT FILING DATE: 1998-06-24
NUMBER OF SEQ ID NOS: 2
SOFTWARE: Patentin Ver. 2.1
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Pred. No. 2.1e-31;
0; Mismatches 385;
                                          US-09-105-537-1
US-09-105-537-1
US-08-635-55A-1
US-08-804-198-1
US-08-804-198-1
US-08-912-53-5
US-08-912-53-5
US-08-913-5
US-09-773-816-1
US-09-155-715A-6
US-09-155-715A-6
US-08-159-448A-6
US-08-459-459A-6
US-08-459-504B-6
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PPLICANT: Lange, Bernd M
TITLE OF INVENTION: 1-DEOXY-D-XXLULOSE-5-PHOSPHATE REDUCTOISOMERASE, AND
TITLE OF INVENTION: METHODS OF USE
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CGAGCGCGTCATCATCACGCCGTCCGGCGGCCGTTCCGCGACTGGAGCCTCGAGCGCAT 560
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Pred. No. 1.9e-15;
0; Mismatches 382;
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CURRENT APPLICATION NUMBER: US/09/491,362
CURRENT FILING DATE: 2000-01-26
EARLIER APPLICATION NUMBER: 60/118,349
EARLIER FILING DATE: 1999-02-03
NUMBER OF SEQ ID NOS: 13
SOFTWARE: PATENTIN US: 2.0
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-Parent No. 6281017_
GENERAL INFORMATION:
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Best Local Similarity 49.0%;
Matches 375; Conservative
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; LOCATION: (1)..(1197)
US-09-491-362-6
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APPLICANT: Lange, Bernd M
TITLE OF INVENTION: 1-DEOXY-D-XYLULOSE-5-PHOSPHATE REDUCTOISOMERASE, AND
TITLE OF INVENTION: METHODS OF USE
FILE REFERENCE: WSUR17549
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359 ACATTGCTCTTGCAAACAAAGAGACATTAATCGCAGGTGGTCCTTTCGTGCTTCCGCTTG
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                                               CCCAGGAGAACGGCGCCACGATCCTGCCGGTGGACAGCGAGCACTCCGCGGTCTTTCAGG
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CURRENT FILING DATE: 2001-06-04.
PRIOR APPLICATION NUMBER: 09/491,362
PRIOR FILING DATE: 2000-01-26
PRIOR FILING DATE: 2000-01-36
PRIOR FILING: 1999-02-03
NUMBER OF SEQ ID NOS: 13
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ORGANISM: Arabidopsis thaliana
FEATURE:
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OF INVENTION: 1-C
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LENGTH: 1732
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Pred. No. 1.9e-15;
0; Mismatches 382;
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                                               10.78;
                                              Query Match 10.7
Best Local Similarity 49.0
Matches 375; Conservative
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APPLICANT: Hain, Rudiger
  ; NAME/KEY: CDS
; LOCATION: (1)..(1197)
US-09-874-562-6
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1-deoxy-D-xylulose-5-phosphate synthase
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                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 125.2; DB 4;
Pred. No. 3.9e-15;
0; Mismatches 383;
                  FILE REFERENCE: 2020US
CURRENT APPLICATION NUMBER: US/09/449,335
CURRENT FILING DATE: 1999-11-24
EARLIER APPLICATION NUMBER: DE 199 35 967.
BEARLIER FILING DATE: 1999-07-30
NUMBER OF SEQ ID NOS: 8
                                                                                                                                                                                                                                                                                                                                                    COCATION: (18). (1448)
COTHER INFORMATION: new coding sequence US-09-449-335-5
                                                                                                                                                                                                                                                                               ORGANISM: Arabidopsis thaliana
                                                                                                                                                                                                                                                                                                                                                                                                                                                        10.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local Similarity 48.88
Matches 374; Conservative
                                                                                                                                                                           SOFTWARE: Patentin Ver. 2.1
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NAME/KEY: CDS
LOCATION: (18
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                                                                                                                                                                                                                                                                                                                                                                                                                               10.5%; Score 124.4; DB 4; Length 48.6%; Pred. No. 5.4e-15; Live 2; Mismatches 383; Indels
                                                                        APPLICANT: LIFORMAILON, Joshua Z.
APPLICANT: Budziszewski, Gregory J.
APPLICANT: Potter. Sharon L.
APPLICANT: Wegatich, Lynette M.
TITLE OF INVENTION: Herbicide Target Genes and Methods;
FILE REFERENCE: PB/5-30780A
CURRENT APPLICATION UNBER: US/09/480,921B
CURRENT FILING DATE: 2000-01-11
SOFTWARE: PATENTIN VET. 2.1
SOFTWARE: PATENTIN VET. 2.1
                                                                                                                                                                                                                                                                                                                                            ; NAME/KEY: misc_feature
; LOCATION: (1)..(1434)
; OTHER INFORMATION: encodes SEQ ID NO:29
US-09-480-921B-28
       US-09-480-921B-28
; Sequence 28, Application US/09480921B
; Patent No. 6387637
                                                                                                                                                                                                                                                                                       TYPE: DNA ORGANISM: Arabidopsis thaliana
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Best Local Similarity 48.6
Matches 372; Conservative
                                                                GENERAL INFORMATION:
                                                                                                                                                                                                                                                                         LENGTH: 1434
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APPLICANT: Busch, Marco
APPLICANT: Busch, Marco
APPLICANT: Hain, Radiger
APPLICANT: Martin, William
APPLICANT: Tietjen, Klaus
APPLICANT: Tietjen, Klaus
APPLICANT: Kloti, Andreas
TITLE OF INVENTION: 1-deoxy-D-xylulose-5-phosphate reductoisomerase and
TITLE OF INVENTION: 1-deoxy-D-xylulose-5-phosphate synthase
TITLE OF INVENTION: 1-deoxy-D-xylulose-5-phosphate synthase
TITLE OF INVENTION: 1-deoxy-D-xylulose-5-phosphate synthase
CURRENT APPLICATION NUMBER: US/09/449,335
CURRENT FILING DATE: 1999-11-24
EARLIER APPLICATION NUMBER: DE 199 35 967.9
NUMBER OF SEQ ID NOS: 8
SOFTWARE: Patentin Ver. 2.1
                                                                  CGGCGCGCGCCTGTCGGCCCCCCTTCAACGCGGCCAAGGAGATCGCGCTCGATCAT 1003
1133 CTTTCAAGAAACCAGACAATGTGAAATACCCATCCATGGATCTTGCTTATGCTGCTGGAC 1192
                                                                                                                                    1193 GAGCTGGAGGCACAATGACTGGAGTTCTCAGCGCCGCCAATGAGAAAGCTGTTGAAATGT 1252
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OTHER INFORMATION: DNA encoding 1-deoxy-D-xylulose-5-phosphate
OTHER INFORMATION: reductoisomerase
                                                                                                                                                                                                              TCATCGCCGGACGCATCGGGTTTCTGGACATGGCGGCGGTGGTCGA 1049
                                                                                                                                                                                                                                                          5; DB<sub>4</sub>;
7.6e-15;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence 1, Application US/09449335 Patent No. 6303365 GENERAL INFORMATION:
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APPLICANT: Croteau, Rodney B
APPLICANT: Croteau, Bernd M
APPLICANT: Lange, Bernd M
TITLE OF INVENTION: 1-DEOXY-D-XYLULOSE-5-PHOSPHATE REDUCTOISOMERASE, AND
TITLE OF INVENTION: METHODS OF USE
FILE REPERENCE: WGOR14977
CURRENT APPLICATION NUMBER: US/09/491,362
CURRENT APPLICATION NUMBER: 60/118,349
EARLIER PILING DATE: 1999-02-03
NUMBER OF SEQ ID NOS: 13
                                                                                                                                                                                944 CGCCGCGCGCCCTGTCGGCCCCCTTCAACGCGGCCAAGGAGATCGCCCTCGATCATT 1003
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Pred. No. 2.3e-10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence 1, Application US/09491362; Patent No. 6281017; GENERAL INFORMATION:
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US-09-491-362-1
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LENGTH: 17
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                                       970 TCATTCATCCGCAAAGTATCATACATTCCATGATTGAAACACGGATTCATCTGTGCTTG 1029
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TCGTCCATCCGCAATCCATCGTCATGCGATGGTGGGCTTCTGCGACGGGGGCCTGATGG
                                                                          773 CCCATCTCGGCCCCGCCGACATGCGCCACGCCATCGGATTCGCGCTGAACTGGCCGGGTC
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APPLICANT: Levin, Joshua Z.
APPLICANT: Levin, Joshua Z.
APPLICANT: Budziszewski, Gregory J.
APPLICANT: Wegrich, Lynette M.
TILLE OF INVENTION: Herbicide Target Genes and Methods
FILE REFERENCE: PB/5-3070RM
CURRENT FILING DATE: 2000-01-11
NUMBER OF SEQ ID NOS: 29
SOFTWARE: PATENTIN VET. 2.1
SEQ ID NO 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 122; DB 4;
Pred. No. 1.5e-14;
0; Mismatches 385
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Best Local Similarity 48.6%;
Matches 372; Conservative
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NAME/KEY: CDS

; LOCATION: (1)..(1434)

US-09-480-921B-9
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APPLICANT: Lange, Bernd M
TITLE OF INVENTION: 1-DEDXY-D-XYLULOSE-5-PHOSPHATE REDUCTOISOMERASE, AND
TITLE OF INVENTION: METHODS OF USE
FILE REFERENCE: WSUR17549
CURRENT APPLICATION NUMBER: US/09/874,562
CURRENT APPLICATION NUMBER: 09/491,362
PRIOR FILING DATE: 2000-01-26
PRIOR FILING DATE: 2000-01-26
PRIOR FILING DATE: 1999-02-03
NUMBER OF SEQ ID NOS: 13
SOFTWARE: PATENTIN VET: 2.0
                                                                                                                650 AGGCGCTCGAGCTGATCGAGACGCGCGAATTCTTCGGCTTCGAGCCGGACCGGATCGAGG 709
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                                CGCTGGCGGCGAGGACACGCCTGCGTCGAGCGCGTCATCATCACGGCGGCGGGGC 532
                                                                837
 CAAAGAAGCACAACGTCAAGATTCTTCCTGCAGACTCCGAACATTCTGCTATATTTCAGT 777
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Pred. No. 2.3e-10;
); Mismatches 388;
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Best Local Similarity 48.3%;
Matches 377; Conservative
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ORGANISM: Mentha piperita
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; LOCATION: (72)..(1496)
US-09-874-562-1
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CGCCCATCGTGGGCGCCCGCGGGCCTCGTGCCCGGAATGCGGGCGCTGAAGCACGGCCGCA 352
                                                                                                                                                      ACATTGCTTTGGCCAATAAAGAGACACTAATCGCTGGAGGCCTTTTGTCCTTCTCTTG 717
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Patent No. 5332596
GENERAL INFORMATION:
APPLICANT: Cheung, Andrew K.
TITLE OF INVENTION: Pseudorabies Virus Deletion Mut;
TITLE OF INVENTION: Involving The EPO and LLT Genes
NUMBER OF SEQUENCES: 7
CORRESPONDENCE ADDRESS:
ADDRESSEE: Cutris P Ribando
STREET: 1815 No. 5352596th University Street
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COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy
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STATE: II
COUNTRY:
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APPLICANT: Akira ARISAWA et al.
TITLE OF INVENTION: GENE ENCODING A PROTEIN HAVING ASYMMETRIC
TITLE OF INVENTION: HYDROLASE ACTIVITY FOR 4-SUBSTITUTED 1,4-DIHYDROPYRIDINE DE
TITLE OF INVENTION: ITS EXPRESSION PRODUCT
   4377 GCGCGCCCGGGCCCGCGGAGCCCGC-----GCCCGGCCTGCCCCCGCTCTGGCCCGAG 4324
                                                        550 CTCGAGCGCATCCGCGCCTGCACCGTGGCCGAGGCGCAGGCCCATCCCAACTGGTCCATG 609
                                                                                                                              490 ACGCCTGCGTCGAGCGCGTCATCATCACGGCGTCCGGGGGCCGTTCCGCGACTGGAGC
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2033 K Street, N.W., #800
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MEDIUM TYPE: Diskette, 3.5 inch, 1.44 mb
COMPUTER: IBM Compatible
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ORGANISM: Streptomyces viridosporus
STRAIN: A-914
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PRIOR APPLICATION DATA:
FILING DATE:
ATTORNEY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence 1, Application US/0900016 Patent No. 6143541
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         REFERENCE/DOCKET NUMBER:
TELECOMMUNICATION INFORMATION:
TELEPHONE: 202-721-8200
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SOFTWARE: Wordperfect 5.1
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/09,
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STRANDEDNESS: double
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NAME: Warren M. Cheek, REGISTRATION NUMBER: 3
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CITY: Washington STATE: D.C.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                        RESULT 11
US-09-000-016-1
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COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/07/945,283
                                                                  UMBER: US/07/945,283
19920911
                                                                                                                                                                             TELECOMMUNICATION INFORMATION:
TELEPHONE: 309-685-4011 ext.513
TELEFAX: 309-685-4128
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                                                                                                                                                                                                                                                                                                                                                                                                                      Pseudorabies virus
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                                                                                                                                             NAME: Ribando, Curtis P
REGISTRATION NUMBER: 27976
                                                                                                                                                                                                                                                                                                                           TOPOLOGY: linear
MOLECULE TYPE: DNA (genomic)
HYPOTHETICAL: NO
                                                                                                                                                                                                                                INFORMATION FOR SEQ ID NO: 1:
SEQUENCE CHARACTERISTICS:
LENGTH: 8438 base pairs
TYPE: NUCLEIC ACID
STRANDEDNESS: double
                                                                                                                      ATTORNEY/AGENT INFORMATION:
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                                                                                                           CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                  ANTI-SENSE: NO
ORIGINAL SOURCE:
ORGANISM: PSE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                         NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NAME/KEY:
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; LOCATION:
US-07-945-283-1
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NAME/KEY:
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US-09-514-340-1
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                                                                                                                                                                                                                       Length 2809
                                                                                                                                                                                                                     Score 72.2; DB 3; Length 2
Pred. No. 2.1e-05;
0; Mismatches 458; Indels
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                                                                                                                                                                                                                         6.1%;
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Best Local Similarity 43.1
Matches 347; Conservative
                                                            LOCATION: 338...2539 IDENTIFICATION METHOD:
                                                                                                                    NAME/KEY: CDS
LOCATION: 2540...2809
IDENTIFICATION METHOD:
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STRAIN:
FEATURE:
NAME/KEY:
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                                                                                                 FEATURE:
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JEST BENCUDING A PROTEIN HAVING ASYMMETRIC HYDROLASE ACTIVITY FOR 4-SUBSTITUTED 1,4-DIHYDROPYRIDINE ITS EXPRESSION PRODUCT
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                                                                                                                                                                     NUMBER OF SEQUENCES: 7
CORRESPONDENCE ADDRESS: 7
ADDRESSEE: Wenderoth, Lind & Ponack, L.L.P.
STREET: 2033 K Street, N.W., #800
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Pred. No. 2.1e-05;
                                                                                                                                                                                                                                                                                                                                                                                       inch, 1.44
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APPLICATION NUMBER: US/09/514,340
FILING DATE: 28 Feb-2000
CLASSIFICATION: <unknown>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRIOR APPLICATION DATA:

APPLICATION NUMBER: 09/000,016
FILING DATE: January 30, 1998
ATTORNEY AGENT INFORMATION:
NAME: Lee Cheng
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LOCATION: 2540...2809
IDENTIFICATION METHOD: P
SEQUENCE DESCRIPTION: SEQ ID NO: 1:
                                                                                                                                                                                                                                                                                                         COUNTRY: U.S.A.
21P: 20006
COMPUTER READABLE FORM:
MEDIUM TYPE: Diskette, 3.5
COMPUTER: IBM COMPATIBLE
OPERATING SYSTEM: MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       REGISTRATION NUMBER: 40,949
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TELEPHONE: 202-721-8200
TELEFAX: 202-721-8250
                                                                                                                                                                                                                                                                                                                                                                                                                                                      SOFTWARE: Wordperfect 5.1
Sequence 1, Application US/09514340
Patent No. 6361987
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LENGTH: 2809 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DENTIFICATION METHOD:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TOPOLOGY: linear MOLECULE TYPE: genomic DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TYPE: nucleic acid
STRANDEDNESS: double
                                              GENERAL INFORMATION:
APPLICANT: AKITA ARISAWA
TITLE OF INVENTION: GENE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TELEX: <Unknown>
INFORMATION FOR SEQ ID NO: 1:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match 6.1%;
Best Local Similarity 43.1%;
Matches 347; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STRAIN: <Unknown>
                                                                                                                                                                                                                                                                  CITY: Washington
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         <Unknown>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ORIGINAL SOURCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NAME/KEY:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           455 ACTCCGCGGTCTTTCAGGCGCTGGCGGGCGAGGACACGGCCTGCGTCGAGCGCGTCATCA 514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 515 TCACGGCGTCCGGCGGCCGTTCCGCGACTGGAGCCTCGAGCGCATCCGCGCCTGCACCG 574
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               278 CC---GACTGGACCATGTCGGCCATCGTGGGCGCCGCGGGCCTCGTGCCCGGAATGCGGG
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3
                                                                                                                                                                                                                                                                                                                                                                                                       Length 5173;
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Patent No. 5824513
GENERAL INFORMATION:
APPLICANT: Ratz, L
APPLICANT: Mealpine, S
APPLICANT: Mealpine, J
TITLE OF INVENTION: Expthromycin Analogs
NUMBER OF SEQUENCES: 27
CORRESPONDENCE ADDRESS:
ADDRESSE: Edward H. Gorman
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STREET: Abbott Laboratories D377/AP6D-2 One Abbott STREET: Park Rd
                                                                                                                                                                                                                                                                                                                                                                                                       Score 71.6; DB 1;
Pred. No. 2.8e-05;
0; Mismatches 229;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   761 AGGCGGCCCGGACGCCCGGCGCTGCTGCCGCCTT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         575 TGGCCGAGGCGCAGGCCCATCCCAACTGGTCCAT
NAME: Mayfield, Denise L. REGISTRATION NUMBER: 33,732 REFERENCE/DOCKET NUMBER: UT TELECOMMUNICATION INFORMATION: 713-787-1400
                                                                                                                                                                                                                                                                                                                                                                                                       6.18;
                                                                                                          TELEFAX: 713-789-2679
INFORMATION FOR SEQ ID NO: 1:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                               LENGTH: 5173 base pairs
                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches 222; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CITY: Abbott Park
                                                                                                                                                                                                       nucleic acid
                                                                                                                                                                                                                                                TOPOLOGY: linear MOLECULE TYPE: CDNA
                                                                                                                                                                                                                                                                                                                                    1..4863
                                                                                                                                                                                                                                                                                                                                                                                                                            Best Local Similarity
                                                                                                                                                                                                                         STRANDEDNESS:
                                                                                                                                                                                                                                                                                                                                      ; LOCATION:
US-08-242-677-1
                                                                                                                                                                                                                                                                                                                 NAME/KEY:
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                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GATCGCGCTCGATCATTCATCGCCGGACGCATCGGGTTTCTGGACATGGCGGCGGTGGT 1046.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2446 ACGCACCACCAGGGGGGGGGATCACCGTGCCGGACCCCAAGGCCAAGGCGCTCTCCGC 2505
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2506 GACCATCGGCTACACCTACGACAGGGGGGATCTCGTCGAAGGCGGGGGGGCGCCGGA 2565
                                                                                                            2146 CCGCACGCCCCCCCCCCGCGCCCCGAGGTCGACCTACGACGTGACCGTCCGGCCACAT 2205
                                                                                                                                                                                                                                                                                                                                                                                                  2206 CGGCCGGGACGGCAAGCCCACGAACACCTCACCGACCTGATCGGCTACGCGGGCCT 2265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2326 GGGCACCTACCTGGTGGACTCCTGGATCGCCAAGGACTTCGGGACGCTCAAGGGCGGCAT 2385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              867 ACAGATIGCGAGCCTCACCTICCAGAAGCCTGACGAGGAACGCTTTCCGGCCCTGAGGCT 926
447 CAGCGAGCACTCCGCGGTCTTTCAGGCGCTGGCGGGGGAGCACGGGCTGGCGTCGAGCG 506
                                                                                                                                                                                                                                                                   CGACAGCGCCTCGATGTTCAACAAGGCGCTCGAGCTGATCGAGACGCGCGAATTCTTCGG 686
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    927 TGCGCGAGACGTCATGGCGGCGCGCGCCTGTCGGGCGCCCCTTCAACGCGGCCAAGGA
                                         1966 CGCCACCGACCCCAAGGCCAAGGCGGCCCCGGCGGCTTCTTCACGCTGGGCGCCCACCAC
                                                                                                                                                                           CTGCACCGTGGCCGAGGCGCAGGCCCATCCCAACTGGTCCATGGGCCAGCGGATCTCCAT
                                                                                                                                                                                                                     2086 CGGCACGGTGGACGGCGCGTACTCGGCGTGGTCGCCACGGGCGGCGGCGACACGGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                   GGGCTTCTGCGACGGGGCCTGATGGCCCATCTCGGCCCCGGCGACATGCGCCCAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CGGATTCGCGCTGAACTGGCCGGGTCGCGGAGGTGCCCGGTCGCCCGGATCGACCTCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          2386 CGACTGGCTGGTCCAGCCGAAGCTGAGCGTCACCAAGGACACCACGCTGACACTCGACGC
                                                                                                                                                                                                                                                                                                                                                         CTTCGAGCCGGACCGGATCGAGGCGGTCGTCCATCCGCAATCCATCGTCCATGCGATGGT
                                                                                     CGTCATCATCACGGCGTCCGGCGGGCCGTTCCGCGACTGGAGCCTCGAGCGCATCCGCGC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PatentIn Release #1.0, Version #1.25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               E: Arnold, White & Durkee P.O. Box 4433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2566 cgcggccgggTcccggggAccTcg 2590
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1047 CGAGGAGGCTCGCGGGCGTTTCG 1071
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence 1, Application US/08242677 Patent No. 5677143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Richard B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ATTORNEY/AGENT INFORMATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICANT: Gaynor, Richa APPLICANT: Wu, Foon W. TITLE OF INVENTION: Cell TITLE OF INVENTION: Trea TITLE OF INVENTION: Trea NUMBER OF SEQUENCES: 9 CORRESPONDENCE ADDRESS: ADDRESSE: ADDRESSE: ADDRESSE: ADDRESSE: ADDRESSE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CURRENT APPLICATION DATA APPLICATION NUMBER: US
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COMPUTER READABLE FORM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GENERAL INFORMATION:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Houston
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       USA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US-08-242-677-1
                                                                                                                                                                                                                                                                                                                                                         687
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LOCATION: 7165. 9216
OTHER INFORMATION: /function= "approximate span of OTHER INFORMATION: dehydratase and encylreductase domains m"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NAME/KEY: misc_feature
LOCATION: 10831..12174
OTHER INFORMATION: /function= "approximate span of of modul"
OTHER INFORMATION: beta-ketoacylACPsynthase domain of modul"
FEATURE:
NAME/KEY: misc_feature
LOCATION: 12379..13350
OTHER INFORMATION: /function= "approximatr' span of other information: acyltransferase domain of module 5"
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LOCATION: 15172..16569
OTHER INFORMATION: /function= "approximate; span of
OTHER INFORMATION: beta-ketoacylACPsynthase domain of modul"
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OTHER INFORMATION: /function= "approximate; span of OTHER INFORMATION: acyltransferase domain of module 4"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /codon_start= 10723 /
/function= "gene =eryA":
/product= "orf3 encoding modules 5
6-deoxyerythronolide B formatio"
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LOCATION: 16768.17721
OTHER INFORMATION: /function- "approximate span of
OTHER INFORMATION: acyltransferase domain of module
FEATURE:
                                                                                                                                                                                                                                                                                                                                                                             NAME/KEY: misc_feature
LOCATION: 10255..10483
OCHER INFORMATION: /function= "approximate span of
OTHER INFORMATION: acyl carrier domain of module 4"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FEATURE:
NAME/KEY: misc_feature
LOCATION: 14857..15114
COTHER INFORMATION: /function= "approximate| span of OTHER INFORMATION: acyl carrier domain of module 5"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NAME/KEY: misc_feature
LOCATION: 10723..15165
OTHER INFORMATION: /function= "approximate, span of
OTHER INFORMATION: module 5"
                                                                                                                                                                                                                                              NAME/KEY: misc_feature
LOCATION: 9433..9984
OTHER INFORMATION: /function- "approximate span
OTHER INFORMATION: beta-ketoreductase of module 4"
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LOCATION: 15166.20235
OTHER INFORMATION: /function= "approximate span of
OTHER INFORMATION: module 6"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /function= "approximate span
beta-ketoreductase of module
                                                                                           FEATURE:
NAME/KEY: misc_feature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NAME/KEY: misc_feature LOCATION: 14062..14610 OTHER INFORMATION: /fun OTHER INFORMATION: beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CDS
10723..20235
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19149..19398
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LOCATION: 10723..20.
OTHER INFORMATION:
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OTHER INFORMATION:
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LOCATION:
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LGCATION: 19..10722
LGCATION: /codon_start= 19
OTHER INFORMATION: /function= "gene eryA"
OTHER INFORMATION: /product= "eryA ORF2 encoding modules 3 & 4 for
OTHER INFORMATION: 6-deoxyerythronolide B"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NAME/KEY: misc_feature
LOCATION: 4471..5847
OCHER INFORMATION: /function= "approximate span of
OTHER INFORMATION: beta-ketoacylACPsynhase domain of module"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NAME/KEY: misc_feature
LOCATION: 97.1482
OTHER INFORMATION: /function= "approximate span of
OTHER INFORMATION: beta-ketoacyl ACP synthase of module 3"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FEATURE:
NAME/KEY: misc_feature
LOCATION: 3406..3921
OTHER INFORMATION: /function= "approximate span of
OTHER INFORMATION: beta-ketoreductase domain of module 3"
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LOCATION: 1693..2670
OTHER INFORMATION: /function= "approximate span of
OTHER INFORMATION: acyltransferase domain module 3"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PEATURE:
NAME/KEY: misc_feature
LOCATION: 19.4470
OTHER INFORMATION: /function= "approximate span of OTHER INFORMATION: module 3"
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LOCATION: 4171.428
COTHER INFORMATION: acyl carrier domain of module 3'
ZIP: 60064-3500

COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMFUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PAtentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/07/642,734C
FILING DATE: 17-JAN-91
CLASSIFICATION: 435
ATTORREY/AGBNT INFORMATION:
NAME: Danckers, Andreas M
REGISTRATION NUMBER: 32625
REFERENCE/POCKET NUMBER: 4952.US.01
TELECOMMUNICATION INFORMATION:
TELECOMMUNICATION INFORMATION:
TELECOMMUNICATION OF SEQ ID NO: 3:
SEQUENCE CHARACTERISTICS:
LEMOTH: 20235 base pairs
TYPE: nucleic acid
STRANDEDMESS: double
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NAME/KEY: misc_feature
LOCATION: 4471..10722
OTHER INFORMATION: _/function= "approximate span of
OTHER INFORMATION: _module 4"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ORGANISM: Saccharopolyspora erythraea
STRAIN: NRRL 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TOPOLOGY: unknown
MOLECULE TYPE: DNA (genomic)
HYPOTHETICAL: NO
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SEQUENCE CHARACTERISTICS:
LENGTH: 20235 base pairs
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NAME/KEY: misc_feature
LOCATION: 19..4470
OTHER INFORMATION: /fur
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LOCATION: 97..1482
OTHER INFORMATION: /fur
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LOCATION: 1693..2670
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   CORRESPONDENCE ADDRESS:
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STRANDEDNESS: doub
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OTHER INFORMATION:
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OTHER INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 unknown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MOLECULE TYPE: DNA HYPOTHETICAL: NO ANTI-SENSE: NO ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                          CLASSIFICATION:
                                                                                                                                                                                                                                                                         FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NAME/KEY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TOPOLOGY:
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                                                                                                            COUNTRY:
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                                                                                                                                                                                                                                    381 CGTGACGGCAGGGCAACTCCTGATGCGGACGGCCCAGGAGAACGGCGCCCACGATCCTGCC 440
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                                                                                                                                                                                                                                                                                                                                                                                                                                                        561 CCGCGCCTGCACCGTGGCCGAGGCGCAATCCCCAACTGGTCCATGGGCCAGCGGAT
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     681 CTTCGGCTTCGAGCCGGACCGGATCGAGGCGGTCGTCCATCCGAATCCATGCTCCATGC
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CAAGGAGATCGCGCTCGATCATTCATCGCCGGACGCATCGGGTTTCTGGACATGGCGGC
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                                                                                                                                                                  Length 20235;
                                                                                                                                                          5.9%; Score 69.4; DB 1; Length 2 43.7%; Pred. No. 7.4e-05; trive 0; Mismatches 391; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 3, Application US/08439009A
Patent No. 6004787
GENERAL INFORMATION:
APPLICANT: Batz, L
APPLICANT: Mcalpine, J B
TITLE OF INVENTION: Method of Directing Biosynthesis of
TITLE OF INVENTION: Specific Polyketides
NUMBER OF SEQUENCES: 27
                                                   NAME/KEY: misc_feature
LOCATION: 19492.20235
COTHER INFORMATION: Chinction= "approximate span of OTHER INFORMATION: thioesterase domain of module 6"
                    acyl carrier domain of module
 /function= "approximate
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1041 GGTGGTCGAGGAGGCTCGCGGGCGTTTCGACCG 1075
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                                                                                                                                                                                                Matches 304; Conservative
OTHER INFORMATION: OTHER INFORMATION:
                                                                                                                                                            Query Match
Best Local Similarity
                                                                                                                          US-07-642-734C-3
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/codon_start= 19
/function= "gene eryA"
/product= "eryA ORF2 encoding modules 3
6-deoxyerythronolide B"
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beta-ketoreductase domain of module
STREET: Abbott Laboratories D377/AP6D-2 One Abbott STREET: Park Rd CITY: Abbott Park STREET: Park STREET: Park
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            OTHER INFORMATION: /function= "approximate span of OTHER INFORMATION: acyltransferase domain module 3" PEATURE:
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LOCATION: 4471..10722
OTHER INFORMATION: /function- "approximate span of
PEATURE: INFORMATION: module 4"
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OTHER INFORMATION: /function= "approximate span o OTHER INFORMATION: acyl carrier domain of module FEATURE:
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beta-ketoacyl ACP synthase of
                                                                                                                                                                                                                                                                                   SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA: 1.009A
FILING DATE: 11-MAY-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ORCANISM: Saccharopolyspora erythraea
STRAIN: NRRL 238
                                                                                                                                                                                                                                                                                                                                                                                                                           NAME: Casuto, Dianne
REGISTRATION NUMBER: 40,943
REFERENCE/DOCKET NUMBER: 4952.US.DI
TELECOMMUNICATION INFORMATION:
TELEPHONE: 847-938-3137
INFORMATION FOR SEQ ID NO: 3:
                                                                                                                                                                                                                                                                    PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                module 3"
                                                                                                                                                                                                                                       COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DNA (genomic)
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COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
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NAME/KEY: misc_feature
LOCATION: 4471..5847

OTHER INFORMATION: /function="approximate span of
OTHER INFORMATION: beta-ketoacylACPsynhase domain of module"
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LOCATION: 10831..12174
OTHER INFORMATION: /function- "approximate span of
OTHER INFORMATION: beta-ketoacylACPsynthase domain of modul"
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LOCATION: 7165..9216
OTHER INFORMATION: /function= "approximate span of
OTHER INFORMATION: dehydratase and encylreductase domains m"
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beta-ketoacylACPsynthase domain of modul"
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LOCATION: 16768..17721
OTHER INFORMATION: __Afunction= "approximate span of
OTHER INFORMATION: acyltransferase domain of module 6"
                                                                                                                                  OTHER INFORMATION: /function- "approximatr span of OTHER INFORMATION: acyltransferase domain of module 5"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WATION: /codon_start= 10723
WATION: /codon_start= 10723
WATION: /function= "gene =eryA"
WATION: /product= "orf3 encoding modules
RMATION: 6-deoxyerythronolide B formatio"
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module 5"
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LOCATION: 10723.15165
OffHER INFORMATION: /function= "approximate span of
OTHER INFORMATION: module 5"
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COCATCON: 14062.14610
COTHER INFORMATION: /tmction= "approximate span of
OTHER INFORMATION: beta-ketoreductase of module 5"
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COGATION: 15166_.20235
COHER INFORMATION: /function= "approximate span of
OTHER INFORMATION: module 6"
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LOCATION: 14857..15114
OTHER INFORMATION: /function= "approximate
OTHER INFORMATION: acyl carrier domain.of m
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9433:.9984
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OTHER INFORMATION: /fur
OTHER INFORMATION: acyl
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LOCATION: 12379..13350
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NAME/KEY: misc_feature
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OTHER INFORMATION:
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LOCATION:
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381 CGTGACGGCAGGGCAACTCCTGATGCGGACGGCCCAGGAGAACGGCGCCACGATCCTGCC 440
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                                                                                                                                                                                                                                                                                                                                                                    Length 20235;
                    /function= "approximate span of beta-ketoreductase domain of module 6"
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                                                               FEATURE:
NAME/KEY: misc_feature
LOCATION: 19149...19398
OTHER INFORMATION: /function- "approximate, span of OTHER INFORMATION: acyl carrier domain of module 6"
FEATURE:
NAME/KEY: misc_feature
LOCATION: 19492...20235
OTHER INFORMATION: /function- "approximate span of OTHER INFORMATION: thioesterase domain of module 6"
US-08-439-009A-3
                                                                                                                                                                                                                                                                                                                                                               Score 69.4; DB 3;
Pred. No. 7.4e-05;
0; Mismatches 391;
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                                                                                                                                                                                                                                                                                                                                                               Ouery Match 5.9%;
Best Local Similarity 43.7%;
Matches 304; Conservative (
18379..18921
                      OTHER INFORMATION: OTHER INFORMATION:
  LOCATION:
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STIC-Biotech/Che	mLib CRFF	91425		4/15	01 +02
From: Sent: To: Subject: 09/673198 Please search the data Thank you,	Saidha, Tekchand Sunday, April 13, 2003 10:11 AM STIC-Biotech/ChemLib 09/673198 - sequence search reque		(31.0)	mey	363 250 498
Jekchand Saidha Primary Examiner Art Unit 1652, CM1, a Mail Box 10001 (703) 305-6595	Room No. 10005		: :	41/8 4/21	33 33

Point of Contact:
Toby Port
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30-394 aa 31-1182 na

	TYPE OF SEARCH:	VENDOR/COST (where applic.)
Searcher:	NA Sequences:	STN:
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Location:	Structures:	Questel/Orbit:
Date Picked Up: 4/15,	Bibliographic:	DRLink:
Date Completed: 422	Litigation:	Lexis/Nexis:
Searcher Prep/Review: 12	Full text:	Sequence Sys.: CC
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Online time: 12	Other:	Other (specify):

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